
LAB 06

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LAB TASK

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

task1_set_root_password

```
shumail@shumail1:~$ sudo passwd root
[sudo] password for shumail:
New password:
Retype new password:
passwd: password updated successfully
shumail@shumail1:~$ _
```

task1_su_root

```
shumail@shumail1:~$ su -
Password:
root@shumail1:~# whoami
root
root@shumail1:~# id
uid=0(root) gid=0(root) groups=0(root)
root@shumail1:~#
```

task1_exit_to_user

```
root@shumail1:~# exit
logout
shumail@shumail1:~$ whoami
shumail
shumail@shumail1:~$ _
```

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

task2_adduser tom

```
shumail@shumail1:~$ 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 []:
Room Number []:
Work Phone []:
Home Phone []:
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' ...
shumail@shumail1:~$

info: Adding new user `tom' to supplemental / extra groups `users' ...
info: Adding user `tom' to group `users' ...
shumail@shumail1:~$ cat /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
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
_apt:x:42:65534::/nonexistent:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:998:998:systemd Network Management:/:/usr/sbin/nologin
systemd-timesync:x:997:997:systemd Time Synchronization:/:/usr/sbin/nologin
dhcpd:x:100:65534:DHCP Client Daemon,,,:/usr/lib/dhcpd:/bin/false
messagebus:x:101:102::/nonexistent:/usr/sbin/nologin
systemd-resolve:x:992:992:systemd Resolver:/:/usr/sbin/nologin
pollinate:x:102:1:/:var/cache/pollinate:/bin/false
polkitd:x:991:991:User for polkitd:/:/usr/sbin/nologin
syslog:x:103:104::/nonexistent:/usr/sbin/nologin
uuidd:x:104:105:/run/uuidd:/usr/sbin/nologin
tcpdump:x:105:107::/nonexistent:/usr/sbin/nologin
tss:x:106:108:TPM software stack,,,:/var/lib/tpm:/bin/false
landscape:x:107:109:/:var/lib/landscape:/usr/sbin/nologin
fwupd-refresh:x:989:989:Firmware update daemon:/var/lib/fwupd:/usr/sbin/nologin
usbmux:x:108:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
shumail:x:1000:1000:shumail:/home/shumail:/bin/bash
sshd:x:109:65534:/:run/sshd:/usr/sbin/nologin
rtkit:x:110:110:RealtimeKit,,,:/proc:/usr/sbin/nologin
dnsmasq:x:999:65534:dnsmasq:/var/lib/misc:/usr/sbin/nologin
cups-pk-helper:x:111:111:user for cups-pk-helper service,,,:/nonexistent:/usr/sbin/nologin
lightdm:x:112:115:Light Display Manager:/var/lib/lightdm:/bin/false
whoopsie:x:113:117:/:nonexistent:/bin/false
avahi:x:114:118:Avahi mDNS daemon,,,:/run/avahi-daemon:/usr/sbin/nologin
saned:x:115:120:/:var/lib/saned:/usr/sbin/nologin
colord:x:116:121:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
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:,:/home/tom:/bin/bash
shumail@shumail1:~$
```

task2_verify_passwd

```

info: Adding new user `tom` to supplemental / extra groups `users` ...
info: Adding user `tom` to group `users` ...
shumail@shumail1:~$ cat /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
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
_apt:x:42:65534::/nonexistent:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:998:998:systemd Network Management:/:/usr/sbin/nologin
systemd-timesync:x:997:997:systemd Time Synchronization:/:/usr/sbin/nologin
dhcpcd:x:100:65534:DHCP Client Daemon,,,:/usr/lib/dhcpcd:/bin/false
messagebus:x:101:102::/nonexistent:/usr/sbin/nologin
systemd-resolve:x:992:992:systemd Resolver:/:/usr/sbin/nologin
pollinate:x:102:1:/:var/cache/pollinate:/bin/false
polkitd:x:991:991:User for polkitd:/:/usr/sbin/nologin
syslog:x:103:104::/nonexistent:/usr/sbin/nologin
uidd:x:104:105::/run/uidd:/usr/sbin/nologin
tcpdump:x:105:107::/nonexistent:/usr/sbin/nologin
tss:x:106:108:TPM software stack,,,:/var/lib/tpm:/bin/false
landscape:x:107:109::/var/lib/landscape:/usr/sbin/nologin
fwupd-refresh:x:989:989:Firmware update daemon:/var/lib/fwupd:/usr/sbin/nologin
usbmux:x:108:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
shumail:x:1000:1000:shumail:/home/shumail:/bin/bash
sshd:x:109:65534::/run/ssh:/usr/sbin/nologin
rtkit:x:110:110:RealtimeKit,,,:/proc:/usr/sbin/nologin
dnsmasq:x:999:65534:dnsmasq:/var/lib/misc:/usr/sbin/nologin
cups-pk-helper:x:111:111:user for cups-pk-helper service,,,:/nonexistent:/usr/sbin/nologin
lightdm:x:112:115:Light Display Manager:/var/lib/lightdm:/bin/false
whoopsie:x:113:117::/nonexistent:/bin/false
avahi:x:114:118:Avahi mDNS daemon,,,:/run/avahi-daemon:/usr/sbin/nologin
saned:x:115:120::/var/lib/saned:/usr/sbin/nologin
colord:x:116:121:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
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,,,:/home/tom:/bin/bash
shumail@shumail1:~$

```

task2_verify_group

```
irc:x:39:
src:x:40:
shadow:x:42:
utmp:x:43:
video:x:44:
sasl:x:45:
plugdev:x:46:shumail
staff:x:50:
games:x:60:
users:x:100:tom
nogroup:x:65534:
systemd-journal:x:999:
systemd-network:x:998:
systemd-timesync:x:997:
input:x:996:
sgx:x:995:
kvm:x:994:
render:x:993:
lxd:x:101:shumail
messagebus:x:102:
systemd-resolve:x:992:
_ssh:x:103:
polkitd:x:991:
crontab:x:990:
syslog:x:104:
uuidd:x:105:
rdma:x:106:
tcpdump:x:107:
tss:x:108:
landscape:x:109:
fwupd-refresh:x:989:
shumail:x:1000:
rtkit:x:110:
lpadmin:x:111:
netdev:x:112:
bluetooth:x:113:
ssl-cert:x:114:
lightdm:x:115:
nopasswdlogin:x:116:
whoopsie:x:117:
avahi:x:118:
scanner:x:119:saned
saned:x:120:
colord:x:121:
pulse:x:122:
pulse-access:x:123:
xrdp:x:124:
docker:x:988:
tom:x:1001:
shumail@shumail1:~$ _
```

task2_verify_shadow

```

docker:x:988:
tom:x:1001:
shumail@shumail1:~$ sudo cat /etc/shadow
root:$y$j9T$UghRQu7J1AHnnqF.Rncke1$1vEzUEKKvRbwEVK.JxVqfxyaHW0.03v251NzUDs.AG2:20394:0:99999:7:::
daemon:*:20305:0:99999:7:::
bin:*:20305:0:99999:7:::
sys:*:20305:0:99999:7:::
sync:*:20305:0:99999:7:::
games:*:20305:0:99999:7:::
man:*:20305:0:99999:7:::
lp:*:20305:0:99999:7:::
mail:*:20305:0:99999:7:::
news:*:20305:0:99999:7:::
uucp:*:20305:0:99999:7:::
proxy:*:20305:0:99999:7:::
www-data:*:20305:0:99999:7:::
backup:*:20305:0:99999:7:::
list:*:20305:0:99999:7:::
irc:*:20305:0:99999:7:::
_apt:*:20305:0:99999:7:::
nobody:*:20305:0:99999:7:::
systemd-networkd:*:20305:0:99999:7:::
systemd-timesyncd:*:20305:0:99999:7:::
dhcpcd:*:20305:0:99999:7:::
messagebus:*:20305:0:99999:7:::
systemd-resolve:*:20305:0:99999:7:::
pollinate:*:20305:0:99999:7:::
polkitd:*:20305:0:99999:7:::
syslog:*:20305:0:99999:7:::
uuidd:*:20305:0:99999:7:::
tcpdump:*:20305:0:99999:7:::
tss:*:20305:0:99999:7:::
landscape:*:20305:0:99999:7:::
fwupd-refresh:*:20305:0:99999:7:::
usbmux:*:20305:0:99999:7:::
shumail:$6$ka001q1zT00rsenk$ujdGYRDjILYiNkYHuVUVQoXUnUViFNjqYHY5dxZ/G293NnLo1zn56hToKj0tBF/zM/LHgoviQ8zS1xc8coPTL0:20391:0:99999:7:::
sshd:*:20305:0:99999:7:::
rtkit:*:20305:0:99999:7:::
dnsmasq:*:20305:0:99999:7:::
cups-pk-helper:*:20305:0:99999:7:::
lightdm:*:20305:0:99999:7:::
whoopsie:*:20305:0:99999:7:::
avahi:*:20305:0:99999:7:::
saned:*:20305:0:99999:7:::
colord:*:20305:0:99999:7:::
pulse:*:20305:0:99999:7:::
cups-browsed:*:20305:0:99999:7:::
xrdp:*:20305:0:99999:7:::
tom:$y$j9T$0aU,e4x,q14xs1aZSkwx0$ZwaiK675cTtxL4GSt.r/BVCpIa0hMLSHAQBSquX6N0:20394:0:99999:7:::
shumail@shumail1:~$

```

Press Ctrl+G.

Task 3 – Create groups; change tom’s primary and secondary groups

task3_groupadd

```

shumail@shumail1:~$ sudo groupadd developer
shumail@shumail1:~$ sudo groupadd devops
shumail@shumail1:~$ sudo groupadd designer
shumail@shumail1:~$ cat /etc/group_

```

```

utmp:x:43:
video:x:44:
sasl:x:45:
plugdev:x:46:shumail
staff:x:50:
games:x:60:
users:x:100:tom
nogroup:x:65534:
systemd-journal:x:999:
systemd-network:x:998:
systemd-timesync:x:997:
input:x:996:
sgx:x:995:
kvm:x:994:
render:x:993:
lxd:x:101:shumail
messagebus:x:102:
systemd-resolve:x:992:
_ssh:x:103:
polkitd:x:991:
crontab:x:990:
syslog:x:104:
uidd:x:105:
rdma:x:106:
tcpdump:x:107:
tss:x:108:
landscape:x:109:
fwupd-refresh:x:989:
shumail:x:1000:
rtkit:x:110:
lpadmin:x:111:
netdev:x:112:
bluetooth:x:113:
ssl-cert:x:114:
lightdm:x:115:
nopasswdlogin:x:116:
whoopsie:x:117:
avahi:x:118:
scanner:x:119:saned
saned:x:120:
colord:x:121:
pulse:x:122:
pulse-access:x:123:
xrdp:x:124:
docker:x:998:
tom:x:1001:
developer:x:1002:
devops:x:1003:
designer:x:1004:
shumail@shumail1:~$

```

task3 change primary group

```

shumail@shumail1:~$ sudo usermod -g designer tom
shumail@shumail1:~$ id tom
uid=1001(tom) gid=1004(designer) groups=1004(designer),100(users)
shumail@shumail1:~$ _

```

task3 add secondary groups

```

shumail@shumail1:~$ sudo usermod -aG developer,devops tom
shumail@shumail1:~$ id tom
uid=1001(tom) gid=1004(designer) groups=1004(designer),100(users),1002(developer),1003(devops)
shumail@shumail1:~$ groups tom
tom : designer users developer devops
shumail@shumail1:~$ _

```

task3 reset secondary groups

```

shumail@shumail1:~$ sudo usermod -G tom tom
shumail@shumail1:~$ id tom
uid=1001(tom) gid=1004(designer) groups=1004(designer),1001(tom)
shumail@shumail1:~$ groups tom
tom : designer tom
shumail@shumail1:~$ _

```

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

task4_add_users

```

shumail@shumail1:~$ 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 []:
    Room Number []:
    Work Phone []:
    Home Phone []:
    Other []:
Is the information correct? [Y/n]
info: Adding new user `jerry' to supplemental / extra groups `users' ...
info: Adding user `jerry' to group `users' ...
shumail@shumail1:~$ sudo useradd scooby
shumail@shumail1:~$

```

task4 scooby su auth failure

```

shumail@shumail1:~$ su - scooby
Password:
su: Authentication failure
shumail@shumail1:~$ _

```

task4 set password scooby

```

shumail@shumail1:~$ sudo passwd scooby
New password:
Retype new password:
passwd: password updated successfully
shumail@shumail1:~$

```

task4 scooby su no home

```

passwd: password updated successfully
shumail@shumail1:~$ su - scooby
Password:
su: warning: cannot change directory to /home/scooby: No such file or directory
$ _

```

task4_verify_users

```
shumail@shumail1:~$ cat /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
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
_apt:x:42:65534::/nonexistent:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:998:998:systemd Network Management:/:/usr/sbin/nologin
systemd-timesync:x:997:997:systemd Time Synchronization:/:/usr/sbin/nologin
dhcpcd:x:100:65534:DHCP Client Daemon,,,:/usr/lib/dhcpcd:/bin/false
messagebus:x:101:102::/nonexistent:/usr/sbin/nologin
systemd-resolve:x:992:992:systemd Resolver:/:/usr/sbin/nologin
pollinate:x:102:1::/var/cache/pollinate:/bin/false
polkitd:x:991:991:User for polkitd:/:/usr/sbin/nologin
syslog:x:103:104::/nonexistent:/usr/sbin/nologin
uidd:x:104:105:/run/uidd:/usr/sbin/nologin
tcpdump:x:105:107::/nonexistent:/usr/sbin/nologin
tss:x:106:108:TPM software stack,,,:/var/lib/tpm:/bin/false
landscape:x:107:109:/var/lib/landscape:/usr/sbin/nologin
fwupd-refresh:x:989:989:Firmware update daemon:/var/lib/fwupd:/usr/sbin/nologin
usbmux:x:100:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
shumail:x:1000:1000:shumail:/home/shumail:/bin/bash
sshd:x:109:65534:/run/sshd:/usr/sbin/nologin
rtkit:x:110:110:RealtimeKit,,,:/proc:/usr/sbin/nologin
dnsmasq:x:999:65534:dnsmasq:/var/lib/misc:/usr/sbin/nologin
cups-pk-helper:x:111:111:user for cups-pk-helper service,,,:/nonexistent:/usr/sbin/nologin
lightdm:x:112:115:Light Display Manager:/var/lib/lightdm:/bin/false
whoopsie:x:113:117:/nonexistent:/bin/false
avahi:x:114:118:Avahi mDNS daemon,,,:/run/avahi-daemon:/usr/sbin/nologin
saned:x:115:120:/var/lib/saned:/usr/sbin/nologin
colord:x:116:121:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
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:::/home/tom:/bin/bash
jerry:x:1005:1005:::/home/jerry:/bin/bash
scooby:x:1006:1006:/home/scooby:/bin/sh
shumail@shumail1:~$ _
```

task4 scooby no home

```
scooby:x:1006:1006:/home/scooby:/bin/sh
shumail@shumail1:~$ ls -ld /home/Scooby
ls: cannot access '/home/Scooby': No such file or directory
shumail@shumail1:~$ ls -ld /home/scooby
ls: cannot access '/home/scooby': No such file or directory
shumail@shumail1:~$ _
```

task4 scooby create home

```
ls: cannot access '/home/scooby': No such file or directory
shumail@shumail1:~$ sudo mkdir -p /home/scooby
shumail@shumail1:~$ sudo chown scooby:scooby /home/scooby
shumail@shumail1:~$ sudo chmod 750 /home/scooby
shumail@shumail1:~$ ls -ld /home/scooby
drwxr-x--- 2 scooby scooby 4096 Nov  2 12:11 /home/scooby
shumail@shumail1:~$ _
```

task4_scooby_login_success

```
shumail@shumail1:~$ su - Scooby
su: user Scooby does not exist or the user entry does not contain all the required fields
shumail@shumail1:~$ su - scooby
Password:
$ pwd
/home/scooby
$ ls -la
total 8
drwxr-x--- 2 scooby scooby 4096 Nov  2 12:11 .
drwxr-xr-x 6 root   root   4096 Nov  2 12:11 ..
$ _
```

task4 verify users

```
shumail@shumail1:~$ cat /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
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
_apt:x:42:65534::/nonexistent:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:998:998:systemd Network Management:/:/usr/sbin/nologin
systemd-timesync:x:997:997:systemd Time Synchronization:/:/usr/sbin/nologin
dhcpcd:x:100:65534:DHCP Client Daemon,,,:/usr/lib/dhcpcd:/bin/false
messagebus:x:101:102::/nonexistent:/usr/sbin/nologin
systemd-resolve:x:992:992:systemd Resolver:/:/usr/sbin/nologin
pollinate:x:102:1::/var/cache/pollinate:/bin/false
polkitd:x:991:991:User for polkitd:/:/usr/sbin/nologin
syslog:x:103:104::/nonexistent:/usr/sbin/nologin
uuidd:x:104:105:/run/uuidd:/usr/sbin/nologin
tcpdump:x:105:107::/nonexistent:/usr/sbin/nologin
tss:x:106:108:TPM software stack,,,:/var/lib/tpm:/bin/false
landscape:x:107:109:/var/lib/landscape:/usr/sbin/nologin
fwupd-refresh:x:989:989:Firmware update daemon:/var/lib/fwupd:/usr/sbin/nologin
usbmux:x:108:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
shumail:x:1000:1000:shumail:/home/shumail:/bin/bash
sshd:x:109:65534:/run/sshd:/usr/sbin/nologin
rtkit:x:110:110:RealtimeKit,,,:/proc:/usr/sbin/nologin
dnsmasq:x:999:65534:dnsmasq:/var/lib/misc:/usr/sbin/nologin
cups-pk-helper:x:111:111:user for cups-pk-helper service,,,:/nonexistent:/usr/sbin/nologin
lightdm:x:112:115:Light Display Manager:/var/lib/lightdm:/bin/false
whoopsie:x:113:117::/nonexistent:/bin/false
avahi:x:114:118:Avahi mDNS daemon,,,:/run/avahi-daemon:/usr/sbin/nologin
saned:x:115:120:/var/lib/saned:/usr/sbin/nologin
colord:x:116:121:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
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,,,:/home/tom:/bin/bash
jerry:x:1005:1005,,,:/home/jerry:/bin/bash
scooby:x:1006:1006:/home/scooby:/bin/sh
shumail@shumail1:~$ _
```

task4 shell switching

```
shumail@shumail1:~$ sudo usermod -s /bin/bash Scooby
usermod: user 'Scooby' does not exist
shumail@shumail1:~$ sudo usermod -s /bin/bash scooby
shumail@shumail1:~$ su - scooby
Password:
scooby@shumail1:~$
```

```
shumail@shumail1:~$ su - Scooby
su: user Scooby does not exist or the user entry does not contain all the required fields
shumail@shumail1:~$ su - scooby
Password:
$ pwd
/home/scooby
$ ls -la
total 8
drwxr-x--- 2 scooby scooby 4096 Nov  2 12:11 .
drwxr-xr-x 6 root   root   4096 Nov  2 12:11 ..
$ _
```

task4_add_groups

```
scooby@shumail1:~$ sudo addgroup jolly
[sudo] password for scooby:
scooby is not in the sudoers file.
scooby@shumail1:~$ sudo addgroup jolly
[sudo] password for scooby:
scooby is not in the sudoers file.
scooby@shumail1:~$ exit
logout
shumail@shumail1:~$ su - shumail
Password:
shumail@shumail1:~$ sudo usermod -aG sudo scooby
shumail@shumail1:~$ groups scooby
scooby : scooby sudo
shumail@shumail1:~$ su - scooby
Password:
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

scooby@shumail1:~$ sudo addgroup jolly
[sudo] password for scooby:
info: Selecting GID from range 1000 to 59999 ...
info: Adding group `jolly' (GID 1007) ...
scooby@shumail1:~$
```

task4_verify_groups

```
plugdev:x:46:shumail
staff:x:50:
games:x:60:
users:x:100:jerry
nogroup:x:65534:
systemd-journal:x:999:
systemd-network:x:998:
systemd-timesync:x:997:
input:x:996:
sgx:x:995:
kvm:x:994:
render:x:993:
lxd:x:101:shumail
messagebus:x:102:
systemd-resolve:x:992:
_ssh:x:103:
polkitd:x:991:
crontab:x:990:
syslog:x:104:
uidd:x:105:
rdma:x:106:
tcpdump:x:107:
tss:x:108:
landscape:x:109:
fwupd-refresh:x:989:
shumail:x:1000:
rtkit:x:110:
lpadmin:x:111:
netdev:x:112:
bluetooth:x:113:
ssl-cert:x:114:
lightdm:x:115:
nopasswdlogin:x:116:
whoopsie:x:117:
avahi:x:118:
scanner:x:119:saned
saned:x:120:
colord:x:121:
pulse:x:122:
pulse-access:x:123:
xrdp:x:124:
docker:x:988:
tom:x:1001:tom
developer:x:1002:
devops:x:1003:
designer:x:1004:
jerry:x:1005:
scooby:x:1006:
jolly:x:1007:
scooby@shumail1:~$
```

task4_delete_groups

```
scooby@shumail1:~$  
scooby@shumail1:~$ sudo delgroup jolly  
warn: The group `jolly' does not exist.  
scooby@shumail1:~$ sudo groupdel anime  
scooby@shumail1:~$ cat /etc/group
```

```
sasl:x:45:  
plugdev:x:46:shumail  
staff:x:50:  
games:x:60:  
users:x:100:jerry  
nogroup:x:65534:  
systemd-journal:x:999:  
systemd-network:x:998:  
systemd-timesync:x:997:  
input:x:996:  
sgx:x:995:  
kvm:x:994:  
render:x:993:  
lxd:x:101:shumail  
messagebus:x:102:  
systemd-resolve:x:992:  
_ssh:x:103:  
polkitd:x:991:  
crontab:x:990:  
syslog:x:104:  
uidd:x:105:  
rdma:x:106:  
tcpdump:x:107:  
tss:x:108:  
landscape:x:109:  
fwupd-refresh:x:989:  
shumail:x:1000:  
rtkit:x:110:  
lpadmin:x:111:  
netdev:x:112:  
bluetooth:x:113:  
ssl-cert:x:114:  
lightdm:x:115:  
nopasswdlogin:x:116:  
whoopsie:x:117:  
avahi:x:118:  
scanner:x:119:saned  
saned:x:120:  
colord:x:121:  
pulse:x:122:  
pulse-access:x:123:  
xrdp:x:124:  
docker:x:988:  
tom:x:1001:tom  
developer:x:1002:  
devops:x:1003:  
designer:x:1004:  
jerry:x:1005:  
scooby:x:1006:  
scooby@shumail1:~$
```

task4_delete_users

```
scooby@shumail1:~$ sudo deluser --remove-home Jerry
fatal: The user `Jerry' does not exist.
scooby@shumail1:~$ sudo deluser --remove-home jerry
info: Looking for files to backup/remove ...
info: Removing files ...
info: Removing crontab ...
info: Removing user `jerry' ...
scooby@shumail1:~$ sudo userdel -r scooby
userdel: user scooby is currently used by process 2460
scooby@shumail1:~$ exit
logout
shumail@shumail1:~$ sudo userdel -r Scooby
userdel: user 'Scooby' does not exist
shumail@shumail1:~$ sudo userdel -r scooby
userdel: scooby mail spool (/var/mail/scooby) not found
shumail@shumail1:~$ su - scooby
su: user scooby does not exist or the user entry does not contain all the required fields
shumail@shumail1:~$ sudo usermod -s /bin/bash scooby
usermod: user 'scooby' does not exist
shumail@shumail1:~$ cat /etc/passwd
```

```
shumail@shumail1:~$ sudo usermod -s /bin/bash scooby
usermod: user 'scooby' does not exist
shumail@shumail1:~$ cat /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
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
_apt:x:42:65534::/nonexistent:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:998:998:systemd Network Management:/:/usr/sbin/nologin
systemd-timesync:x:997:997:systemd Time Synchronization:/:/usr/sbin/nologin
dhcpcd:x:100:65534:DHCP Client Daemon,,,:/usr/lib/dhcpcd:/bin/false
messagebus:x:101:102::/nonexistent:/usr/sbin/nologin
systemd-resolve:x:992:992:systemd Resolver:/:/usr/sbin/nologin
pollinate:x:102:1::/var/cache/pollinate:/bin/false
polkitd:x:991:991:User for polkitd:/:/usr/sbin/nologin
syslog:x:103:104::/nonexistent:/usr/sbin/nologin
uuidd:x:104:105::/run/uuidd:/usr/sbin/nologin
tcpdump:x:105:107::/nonexistent:/usr/sbin/nologin
tss:x:106:108:TPM software stack,,,:/var/lib/tpm:/bin/false
landscape:x:107:109::/var/lib/landscape:/usr/sbin/nologin
fwupd-refresh:x:989:989:Firmware update daemon:/var/lib/fwupd:/usr/sbin/nologin
usbmux:x:108:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
shumail:x:1000:1000:shumail:/home/shumail:/bin/bash
sshd:x:109:65534::/run/sshd:/usr/sbin/nologin
rtkit:x:110:110:RealtimeKit,,,:/proc:/usr/sbin/nologin
dnsmasq:x:999:65534:dnsmasq:/var/lib/misc:/usr/sbin/nologin
cups-pk-helper:x:111:111:user for cups-pk-helper service,,,:/nonexistent:/usr/sbin/nologin
lightdm:x:112:115:Light Display Manager:/var/lib/lightdm:/bin/false
whoopsie:x:113:117::/nonexistent:/bin/false
avahi:x:114:118:Avahi mDNS daemon,,,:/run/avahi-daemon:/usr/sbin/nologin
saned:x:115:120::/var/lib/saned:/usr/sbin/nologin
colord:x:116:121:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
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,,,:/home/tom:/bin/bash
shumail@shumail1:~$
```

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

task5_create_student

```
shumail@shumail1:~$ 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 []:
  Room Number []:
  Work Phone []:
  Home Phone []:
  Other []:
Is the information correct? [Y/n]
info: Adding new user `student' to supplemental / extra groups `users' ...
info: Adding user `student' to group `users' ...
shumail@shumail1:~$
```

task5_create_files

```
su: user student does not exist or the user entry does not contain all of
shumail@shumail1:~$ su - student
Password:
student@shumail1:~$ touch file1
student@shumail1:~$ mkdir -p dir1
student@shumail1:~$ touch dir1/file2
student@shumail1:~$ ls -l
total 4
drwxrwxr-x 2 student student 4096 Nov  2 12:37 dir1
-rw-rw-r-- 1 student student   0 Nov  2 12:36 file1
student@shumail1:~$ _
```

task5_chown_file1

see man sudo_root for details.

```
student@shumail1:~$ sudo chown tom file1
[sudo] password for student:
student@shumail1:~$ ls -l file1

-rw-rw-r-- 1 tom student 0 Nov  2 12:36 file1
student@shumail1:~$
student@shumail1:~$
```

task5_chgrp_file1

```
student@shumail1:~$
student@shumail1:~$ sudo chgrp devops file1
student@shumail1:~$ ls -l file1
-rw-rw-r-- 1 tom devops 0 Nov  2 12:36 file1
student@shumail1:~$
```

task5 file types

```
student@shumail1:~$ ls -l
total 4
drwxrwxr-x 2 student student 4096 Nov  2 12:37 dir1
-rw-rw-r-- 1 tom      devops   0 Nov  2 12:36 file1
student@shumail1:~$ ls -l dir1
total 0
-rw-rw-r-- 1 student student 0 Nov  2 12:37 file2
student@shumail1:~$ ls -l /dev/null
crw-rw-rw- 1 root root 1, 3 Nov  2 11:40 /dev/null
student@shumail1:~$ file file1 dir1 /dev/null
file1:      empty
dir1:       directory
/dev/null:  character special (1/3)
student@shumail1:~$ _
```

Task 6 – Change permissions using symbolic mode

task6_su_student

```
shumail@shumail1:~$ su - student
Password:
student@shumail1:~$ cd ~
student@shumail1:~$ ls -l file1
-rw-rw-r-- 1 tom devops 0 Nov  2 12:36 file1
```

task6_chmod_remove_rwx

```
student@shumail1:~$ chmod -rwx file1
student@shumail1:~$ ls -l file1
----- 1 student student 0 Nov  2 12:36 file1
student@shumail1:~$
```

task6_chmod_add_r

```
student@shumail1:~$ chmod +r file1

student@shumail1:~$
student@shumail1:~$ ls -l file1
-r--r--r-- 1 student student 0 Nov  2 12:36 file1
student@shumail1:~$ _
```

task6_chmod_u_plus_x

```
student@shumail1:~$ chmod u+x file1
student@shumail1:~$ ls -l file1
-r-xr--r-- 1 student student 0 Nov  2 12:36 file1
student@shumail1:~$
```

task6_chmod_ug_plus_w

```
student@shumail1:~$
student@shumail1:~$ chmod ug+w file1

student@shumail1:~$
student@shumail1:~$ ls -l file1
-rwxrw-r-- 1 student student 0 Nov  2 12:36 file1
student@shumail1:~$
```

task6_chmod_ugo_minus_rwx

```
student@shumail1:~$ chmod ugo-rwx file1
student@shumail1:~$ ls -l file1
----- 1 student student 0 Nov  2 12:36 file1
student@shumail1:~$ _
```

Task 7 – Change permissions using “set” symbolic form (u= g= o=)

task7_student_context

```
student@shumail1:~$ cd ~
student@shumail1:~$ ls -l file1
----- 1 student student 0 Nov  2 12:36 file1
student@shumail1:~$
```

task7_chmod_set_all_rwx

```
student@shumail1:~$ chmod u=rwx,g=rwx,o=rwx file1
student@shumail1:~$ ls -l file1
-rwxrwxrwx 1 student student 0 Nov  2 12:36 file1
student@shumail1:~$ _
```

task7_remove_exec_go

```
student@shumail1:~$ chmod g=rw,o=rw file1

student@shumail1:~$ 
student@shumail1:~$ ls -l file1
-rwxrw-rw- 1 student student 0 Nov  2 12:36 file1
student@shumail1:~$
```

task7_remove_all_perms

```
student@shumail1:~$ chmod u=,g=,o= file1
student@shumail1:~$ ls -l file1
----- 1 student student 0 Nov  2 12:36 file1
student@shumail1:~$
```

Task 8 – Change permissions using numeric (octal) mode

task8_student_context

```
student@shumail1:~$ cd ~
student@shumail1:~$ ls -l file1
----- 1 student student 0 Nov  2 12:36 file1
student@shumail1:~$ _
```

task8_chmod_777

```
student@shumail1:~$ chmod 777 file1
student@shumail1:~$ ls -l file1
-rwxrwxrwx 1 student student 0 Nov  2 12:36 file1
student@shumail1:~$ _
```

task8_chmod_700

```
student@shumail1:~$ chmod 700 file1
student@shumail1:~$ ls -l file1
-rwx----- 1 student student 0 Nov  2 12:36 file1
student@shumail1:~$
```

task8_chmod_744

```
student@shumail1:~$ chmod 744 file1
student@shumail1:~$ ls -l file1
-rwxr--r-- 1 student student 0 Nov  2 12:36 file1
student@shumail1:~$
```

task8_chmod_640

```
student@shumail1:~$ chmod 640 file1
student@shumail1:~$ ls -l file1
-rw-r----- 1 student student 0 Nov  2 12:36 file1
student@shumail1:~$
```

task8 chmod 664

```
-rw-rw-r-- 1 student student 0 Nov  2 12:36 file1
student@shumail1:~$ chmod 664 file1
student@shumail1:~$ ls -l file1
-rw-rw-r-- 1 student student 0 Nov  2 12:36 file1
student@shumail1:~$
```

task8 chmod 775

```
student@shumail1:~$ chmod 775 file1
student@shumail1:~$ ls -l file1
-rwxrwxr-x 1 student student 0 Nov  2 12:36 file1
student@shumail1:~$ _
```

task8 chmod 750

```
student@shumail1:~$ chmod 750 file1
student@shumail1:~$ ls -l file1
-rwxr-x--- 1 student student 0 Nov  2 12:36 file1
student@shumail1:~$ _
```

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

task9_grep_less

```
2025-11-02T11:40:37.700403+00:00 shumail1 systemd[1]: rsyslog.service: Sent signal SIGHUP to main process 950 (rsyslogd) on client request.
2025-11-02T11:40:37.701260+00:00 shumail1 rsyslogd: [origin software="rsyslogd" swVersion="8.2312.0" x-pid="950" x-info="https://www.rsyslog.com"] rsyslogd was
HUPed
2025-11-02T11:40:37.761954+00:00 shumail1 systemd[1]: logrotate.service: Deactivated successfully.
2025-11-02T11:40:37.766076+00:00 shumail1 systemd[1]: Finished logrotate.service - Rotate log files.
2025-11-02T11:40:37.842243+00:00 shumail1 systemd-resolved[670]: Using degraded feature set UDP instead of UDP+EDNS0 for DNS server 192.168.183.2.
2025-11-02T11:40:38.066516+00:00 shumail1 snapd[859]: overlord.go:208: Acquiring state lock file
2025-11-02T11:40:38.066530+00:00 shumail1 snapd[859]: overlord.go:293: Acquired state lock file
2025-11-02T11:40:38.083806+00:00 shumail1 snapd[859]: daemon.go:276: started snapd/2.72 (series 16; classic) ubuntu/24.04 (amd64) linux/6.8.0-87-generic.
2025-11-02T11:40:38.113947+00:00 shumail1 systemd[1]: Finished apparmor.service - automatic crash report generation.
2025-11-02T11:40:38.119761+00:00 shumail1 kernel: loop3: detected capacity change from 0 to 8
2025-11-02T11:40:38.129593+00:00 shumail1 systemd[1]: tmp-syscheck\x2ddmountpoint\x2d24380268831.mount: Deactivated successfully.
2025-11-02T11:40:38.131960+00:00 shumail1 snapd[859]: daemon.go:370: adjusting status timeout by 45s (pessimistic estimate of 30s plus 5s per snap)
2025-11-02T11:40:38.147866+00:00 shumail1 snapd[859]: backends.go:70: AppArmor is enabled and all features are available (using snapd provided
apparmor_parser)
2025-11-02T11:40:38.169999+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38Z" level=warning msg="containerd config version '1' has been deprecated and
will be converted on each startup in containerd v2.0, use 'containerd config migrate' after upgrading to containerd 2.0 to avoid conversion on startup"
2025-11-02T11:40:38.169999+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.1686546342" level=info msg="starting containerd" revision=b98a3aace6563208
42a23f4a392a33f46af97866 version=v1.7.28
2025-11-02T11:40:38.193083+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.192772782" level=info msg="loading plugin '\io.containerd.snapshotter.v1.
aufs\'. ..." type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.197704+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.1975190392" level=info msg="skip loading plugin '\io.containerd.snapshotte
r.v1.aufs\'. ..." error="aufs is not supported (modprobe aufs failed: exit status 1 '\modprobe: FATAL: Module aufs not found in directory /lib/modules/6.8.0-87-ge
neric\n\"): skip plugin" type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.197767+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.197530162" level=info msg="loading plugin '\io.containerd.event.v1.exchan
ge\'. ..." type=io.containerd.event.v1
2025-11-02T11:40:38.197784+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.1975682352" level=info msg="loading plugin '\io.containerd.internal.v1.opt
\'. ..." type=io.containerd.internal.v1
2025-11-02T11:40:38.198495+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.1983657952" level=info msg="loading plugin '\io.containerd.warning.v1.depr
ecations\'. ..." type=io.containerd.warning.v1
2025-11-02T11:40:38.198534+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.1983906432" level=info msg="loading plugin '\io.containerd.snapshotter.v1.
blockfile\'. ..." type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.199207+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.1988053772" level=info msg="skip loading plugin '\io.containerd.snapshotte
r.v1.blockfile\'. ..." error="no scratch file generator: skip plugin" type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.199285+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.1988257252" level=info msg="loading plugin '\io.containerd.snapshotter.v1.
btrfs\'. ..." type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.199260+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.1990751012" level=info msg="skip loading plugin '\io.containerd.snapshotte
r.v1.btrfs\'. ..." error="path '/var/lib/containerd/io.containerd.snapshotter.v1.btrfs (ext4)' must be a btrfs filesystem to be used with the btrfs snapshotter: ski
p plugin" type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.199275+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.1990891062" level=info msg="loading plugin '\io.containerd.snapshotter.v1.
devmapper\'. ..." type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.199295+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.1991002652" level=info msg="skip loading plugin '\io.containerd.snapshotte
r.v1.devmapper\'. ..." error="devmapper not configured: skip plugin" type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.199313+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.1991002652" level=info msg="loading plugin '\io.containerd.snapshotter.v1.
native\'. ..." type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.199685+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.1995645952" level=info msg="loading plugin '\io.containerd.snapshotter.v1.
overlayfs\'. ..." type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.200479+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.2001070312" level=info msg="loading plugin '\io.containerd.snapshotter.v1.
zfs\'. ..." type=io.containerd.snapshotter.v1
:
```

task9_grep_more

```

2025-11-02T11:40:37.700403+00:00 shumail1 systemd[1]: rsyslog.service: Sent signal SIGHUP to main process 950 (rsyslogd) on client request.
2025-11-02T11:40:37.701260+00:00 shumail1 rsyslogd: [origin software="rsyslogd" swVersion="8.2312.0" x-pid="950" x-info="https://www.rsyslog.com"] rsyslogd was
HUPed
2025-11-02T11:40:37.761954+00:00 shumail1 systemd[1]: logrotate.service: Deactivated successfully.
2025-11-02T11:40:37.760676+00:00 shumail1 systemd[1]: Finished logrotate.service - Rotate log files.
2025-11-02T11:40:37.842243+00:00 shumail1 systemd-resolved[670]: Using degraded feature set UDP instead of UDP+EDNS0 for DNS server 192.168.183.2.
2025-11-02T11:40:38.066316+00:00 shumail1 snappd[859]: overlord.go:288: Acquiring state lock file
2025-11-02T11:40:38.065530+00:00 shumail1 snappd[859]: overlord.go:293: Acquired state lock file
2025-11-02T11:40:38.065006+00:00 shumail1 snappd[859]: daemon.go:276: started snapd/2.72 (series 16; classic) ubuntu/24.04 (amd64) linux/6.8.0-87-generic.
2025-11-02T11:40:38.113947+00:00 shumail1 systemd[1]: Finished apport.service - automatic crash report generation.
2025-11-02T11:40:38.119761+00:00 shumail1 kernel: loop3: detected capacity change from 0 to 8
2025-11-02T11:40:38.125593+00:00 shumail1 systemd[1]: tmp-syscheck\x2dmountpoint\x2d2490268831.mount: Deactivated successfully.
2025-11-02T11:40:38.131950+00:00 shumail1 snappd[859]: daemon.go:370: adjusting startup timeout by 45s (pessimistic estimate of 30s plus 5s per snap)
2025-11-02T11:40:38.147066+00:00 shumail1 snappd[859]: backends.go:70: AppArmor status: apparmor is enabled and all features are available (using snapd provided
apparmor parser)
2025-11-02T11:40:38.168999+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38Z" level=warning msg="containerd config version `1` has been deprecated and
will be converted on each startup in containerd v2.0, use `containerd config migrate` after upgrading to containerd 2.0 to avoid conversion on startup"
2025-11-02T11:40:38.169099+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.168654634Z" level=info msg="starting containerd" revision=b98a3ace6563208
42a23f4a392a53f46af97866 version=v1.7.20
2025-11-02T11:40:38.193083+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.192772702Z" level=info msg="loading plugin \io.containerd.snapshotter.v1.
aufs\..." type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.197704+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.197519039Z" level=info msg="skip loading plugin \io.containerd.snapshotte
r.v1.aufs\..." errors="aufs is not supported (modprobe aufs failed: exit status 1 \modprobe: FATAL: Module aufs not found in directory /lib/modules/6.8.0-87-ge
neric\x86_64\:)" type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.197767+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.197553016Z" level=info msg="loading plugin \io.containerd.event.v1.exchan
ge\..." type=io.containerd.event.v1
2025-11-02T11:40:38.197784+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.197560235Z" level=info msg="loading plugin \io.containerd.internal.v1.opt
v1\..." type=io.containerd.internal.v1
2025-11-02T11:40:38.198459+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.198365795Z" level=info msg="loading plugin \io.containerd.warning.v1.depr
ecations\..." type=io.containerd.warning.v1
2025-11-02T11:40:38.198593+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.198390643Z" level=info msg="loading plugin \io.containerd.snapshotter.v1.
blockfile\..." type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.199207+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.198005377Z" level=info msg="skip loading plugin \io.containerd.snapshotte
r.v1.blockfile\..." errors="no scratch file generator: skip plugin" type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.199235+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.198025725Z" level=info msg="loading plugin \io.containerd.snapshotter.v1.
btrfs\..." type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.199260+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.199075101Z" level=info msg="skip loading plugin \io.containerd.snapshotte
r.v1.btrfs\..." errors="path /var/lib/containerd/io.containerd.snapshotter.v1.btrfs (ext4) must be a btrfs filesystem to be used with the btrfs snapshotter: ski
p plugin" type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.199275+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.199009186Z" level=info msg="loading plugin \io.containerd.snapshotter.v1.
devmapper\..." type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.199295+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.199100265Z" level=info msg="skip loading plugin \io.containerd.snapshotte
r.v1.devmapper\..." errors="devmapper not configured: skip plugin" type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.199313+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.199107776Z" level=info msg="loading plugin \io.containerd.snapshotter.v1.
native\..." type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.199365+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.199564595Z" level=info msg="loading plugin \io.containerd.snapshotter.v1.
overlayfs\..." type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.200479+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.200107031Z" level=info msg="loading plugin \io.containerd.snapshotter.v1.
zfs\..." type=io.containerd.snapshotter.v1
--More--

```

task9_grep_head

```

$ cat
student@shumail1:~$ sudo grep -E 'fail|error' /var/log/syslog | head
2025-11-02T11:40:38.197704+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.197519039Z" level=info msg="skip loading plugin \io.containerd.snapshotte
r.v1.aufs\..." errors="aufs is not supported (modprobe aufs failed: exit status 1 \modprobe: FATAL: Module aufs not found in directory /lib/modules/6.8.0-87-ge
neric\x86_64\:)" type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.199207+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.198005377Z" level=info msg="skip loading plugin \io.containerd.snapshotte
r.v1.blockfile\..." errors="no scratch file generator: skip plugin" type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.199260+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.199075101Z" level=info msg="skip loading plugin \io.containerd.snapshotte
r.v1.btrfs\..." errors="path /var/lib/containerd/io.containerd.snapshotter.v1.btrfs (ext4) must be a btrfs filesystem to be used with the btrfs snapshotter: ski
p plugin" type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.199295+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.199100265Z" level=info msg="skip loading plugin \io.containerd.snapshotte
r.v1.devmapper\..." errors="devmapper not configured: skip plugin" type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.200529+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.200216468Z" level=info msg="skip loading plugin \io.containerd.snapshotte
r.v1.zfs\..." errors="path /var/lib/containerd/io.containerd.snapshotter.v1.zfs must be a zfs filesystem to be used with the zfs snapshotter: skip plugin" type=
io.containerd.snapshotter.v1
2025-11-02T11:40:38.207218+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.206466076Z" level=info msg="skip loading plugin \io.containerd.tracing.pr
ocessor.v1.otlp\..." errors="skip plugin: tracing endpoint not configured" type=io.containerd.tracing.processor.v1
2025-11-02T11:40:38.207278+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.206486857Z" level=info msg="skip loading plugin \io.containerd.internal.v
1.tracing\..." errors="skip plugin: tracing endpoint not configured" type=io.containerd.internal.v1
2025-11-02T11:40:38.861201+00:00 shumail1 dockerd[1475]: time="2025-11-02T11:40:38.860661903Z" level=info msg="CDI directory does not exist, skipping: failed to
monitor for changes: no such file or directory" dir=/var/run/cdi
2025-11-02T11:40:38.861238+00:00 shumail1 dockerd[1475]: time="2025-11-02T11:40:38.860684309Z" level=info msg="CDI directory does not exist, skipping: failed to
monitor for changes: no such file or directory" dir=/etc/cdi
2025-11-02T11:40:42.391233+00:00 shumail1 multipath: sda: failed to get sysfs uid: No such file or directory
student@shumail1:~$ _

```

task9_redirect overwrite

```

2025-11-02T11:40:42.031233+00:00 shumail1 multipath: sda: failed to get sysfs uid: No such file or directory
student@shumail1:~$ sudo grep -i systemd /var/log/syslog > ~/syslog_systemd.txt
student@shumail1:~$ _

```

task9 redirect append

```
2025-11-02T12:40:03.347370+00:00 shumail1 systemd[1]: Starting sysstat-collect.service - system activity accounting tool...
2025-11-02T12:40:03.382230+00:00 shumail1 systemd[1]: sysstat-collect.service: Deactivated successfully.
2025-11-02T12:40:03.383105+00:00 shumail1 systemd[1]: Finished sysstat-collect.service - system activity accounting tool.
2025-11-02T12:46:06.210156+00:00 shumail1 systemd[1]: Started getty@tty6.service - Getty on tty6.
2025-11-02T12:49:49.623933+00:00 shumail1 systemd[1]: Starting motd-news.service - Message of the Day...
2025-11-02T12:49:49.413833+00:00 shumail1 systemd[1]: motd-news.service: Deactivated successfully.
2025-11-02T12:49:49.416200+00:00 shumail1 systemd[1]: Finished motd-news.service - Message of the Day.
2025-11-02T12:49:49.416599+00:00 shumail1 systemd[1]: motd-news.service: Consumed 1.048s CPU time.
2025-11-02T12:50:17.363723+00:00 shumail1 systemd[1]: Starting sysstat-collect.service - system activity accounting tool...
2025-11-02T12:50:17.418116+00:00 shumail1 systemd[1]: sysstat-collect.service: Deactivated successfully.
2025-11-02T12:50:17.418017+00:00 shumail1 systemd[1]: Finished sysstat-collect.service - system activity accounting tool.
2025-11-02T13:00:13.335226+00:00 shumail1 systemd[1]: Starting sysstat-collect.service - system activity accounting tool...
2025-11-02T13:00:13.358743+00:00 shumail1 systemd[1]: sysstat-collect.service: Deactivated successfully.
2025-11-02T13:00:13.359441+00:00 shumail1 systemd[1]: Finished sysstat-collect.service - system activity accounting tool.
2025-11-02T13:10:17.572503+00:00 shumail1 systemd[1]: Starting sysstat-collect.service - system activity accounting tool...
2025-11-02T13:10:17.550299+00:00 shumail1 systemd[1]: sysstat-collect.service: Deactivated successfully.
2025-11-02T13:10:17.550638+00:00 shumail1 systemd[1]: Finished sysstat-collect.service - system activity accounting tool.
2025-11-02T13:20:17.418670+00:00 shumail1 systemd[1]: Finished sysstat-collect.service - system activity accounting tool...
2025-11-02T13:20:17.418670+00:00 shumail1 systemd[1]: Starting sysstat-collect.service - system activity accounting tool...
2025-11-02T13:24:44.572222+00:00 shumail1 systemd-timesyncd[671]: Timed out waiting for reply from 185.125.190.58:123 (ntp.ubuntu.com).
2025-11-02T13:24:54.822249+00:00 shumail1 systemd-timesyncd[671]: Timed out waiting for reply from 91.189.91.157:123 (ntp.ubuntu.com).
2025-11-02T13:25:05.075967+00:00 shumail1 systemd-timesyncd[671]: Timed out waiting for reply from 185.125.190.58:123 (ntp.ubuntu.com).
2025-11-02T13:25:33.385883+00:00 shumail1 systemd-timesyncd[671]: Network configuration changed, trying to establish connection.
2025-11-02T13:25:34.223695+00:00 shumail1 systemd-timesyncd[671]: Contacted time server 185.125.190.58:123 (ntp.ubuntu.com).
2025-11-02T13:29:43.352179+00:00 shumail1 systemd[1]: Starting fwupd-refresh.service - Refresh fwupd metadata and update motd...
2025-11-02T13:29:43.537764+00:00 shumail1 systemd[1]: fwupd-refresh.service: Deactivated successfully.
2025-11-02T13:29:43.538100+00:00 shumail1 systemd[1]: Finished fwupd-refresh.service - Refresh fwupd metadata and update motd.
2025-11-02T13:30:19.340571+00:00 shumail1 systemd[1]: Starting sysstat-collect.service - system activity accounting tool...
2025-11-02T13:30:19.386248+00:00 shumail1 systemd[1]: sysstat-collect.service: Deactivated successfully.
2025-11-02T13:30:19.386160+00:00 shumail1 systemd[1]: Finished sysstat-collect.service - system activity accounting tool.
2025-11-02T13:40:17.358445+00:00 shumail1 systemd[1]: Starting sysstat-collect.service - system activity accounting tool...
2025-11-02T13:40:17.413326+00:00 shumail1 systemd[1]: sysstat-collect.service: Deactivated successfully.
2025-11-02T13:40:17.413776+00:00 shumail1 systemd[1]: Finished sysstat-collect.service - system activity accounting tool.
2025-11-02T13:50:03.340855+00:00 shumail1 systemd[1]: Starting sysstat-collect.service - system activity accounting tool...
2025-11-02T13:50:03.386524+00:00 shumail1 systemd[1]: sysstat-collect.service: Deactivated successfully.
2025-11-02T13:50:03.387859+00:00 shumail1 systemd[1]: Finished sysstat-collect.service - system activity accounting tool.
2025-11-02T14:00:17.383156+00:00 shumail1 systemd[1]: Starting sysstat-collect.service - system activity accounting tool...
2025-11-02T14:00:17.452322+00:00 shumail1 systemd[1]: sysstat-collect.service: Deactivated successfully.
2025-11-02T14:00:17.453467+00:00 shumail1 systemd[1]: Finished sysstat-collect.service - system activity accounting tool.
2025-11-02T14:10:17.358612+00:00 shumail1 systemd[1]: Starting sysstat-collect.service - system activity accounting tool...
2025-11-02T14:10:17.408292+00:00 shumail1 systemd[1]: sysstat-collect.service: Deactivated successfully.
2025-11-02T14:10:17.409639+00:00 shumail1 systemd[1]: Finished sysstat-collect.service - system activity accounting tool.
2025-11-02T11:40:39.538826+00:00 shumail1 NetworkManager[670]: <info> [1762053639.5386] manager: (docker0): new Bridge device (/org/freedesktop/NetworkManager/Devices/3)
2025-11-02T11:40:39.403764+00:00 shumail1 systemd-networkd[644]: docker0: Link UP
2025-11-02T11:40:40.541910+00:00 shumail1 systemd[1]: NetworkManager-dispatcher.service: Deactivated successfully.
2025-11-02T11:41:43.066614+00:00 shumail1 systemd[1985]: Listening on dnsmgr.socket - dnsmgr network certificate management daemon.
2025-11-02T13:25:33.385883+00:00 shumail1 systemd-timesyncd[671]: Network configuration changed, trying to establish connection.
student@shumail1:~$ _
```

task9_journalctl_alternative

```
(GNU Binutils for Ubuntu) 2.42) #88-Ubuntu SMP PREEMPT_DYNAMIC Sat Oct 11 09:28:41 UTC 2025 (Ubuntu 6.8.0-87.88-generic 6.8.12)
Oct 30 16:37:12 shumail1 kernel: Command line: BOOT_IMAGE=/vmlinuz-6.8.0-87-generic root=/dev/mapper/ubuntu--vg-ubuntu--lv ro
Oct 30 16:37:12 shumail1 kernel: KERNEL supported cpus:
Oct 30 16:37:12 shumail1 kernel: Intel GenuineIntel
Oct 30 16:37:12 shumail1 kernel: AMD AuthenticAMD
Oct 30 16:37:12 shumail1 kernel: Hygon HygonGenuine
Oct 30 16:37:12 shumail1 kernel: Centauri CentaurHauls
Oct 30 16:37:12 shumail1 kernel: zhaoxin Shanghai
Oct 30 16:37:12 shumail1 kernel: Disabled fast string operations
Oct 30 16:37:12 shumail1 kernel: BIOS-provided physical RAM map:
Oct 30 16:37:12 shumail1 kernel: BIOS-e820: [mem 0x0000000000000000-0x00000000000097fff] usable
Oct 30 16:37:12 shumail1 kernel: BIOS-e820: [mem 0x0000000000009800-0x0000000000009ffff] reserved
Oct 30 16:37:12 shumail1 kernel: BIOS-e820: [mem 0x000000000000a000-0x0000000000000ffff] reserved
Oct 30 16:37:12 shumail1 kernel: BIOS-e820: [mem 0x000000000000100000-0x000000000000bfecffff] usable
Oct 30 16:37:12 shumail1 kernel: BIOS-e820: [mem 0x000000000000bfec0000-0x000000000000bfeffff] ACPI data
Oct 30 16:37:12 shumail1 kernel: BIOS-e820: [mem 0x000000000000bfeff000-0x000000000000bfeffff] ACPI NVS
Oct 30 16:37:12 shumail1 kernel: BIOS-e820: [mem 0x000000000000bff00000-0x000000000000bffffffffff] usable
Oct 30 16:37:12 shumail1 kernel: BIOS-e820: [mem 0x000000000000000000-0x0000000000000000ffff] reserved
Oct 30 16:37:12 shumail1 kernel: BIOS-e820: [mem 0x000000000000fec00000-0x000000000000fec0ffff] reserved
Oct 30 16:37:12 shumail1 kernel: BIOS-e820: [mem 0x000000000000fee00000-0x000000000000fee0ffff] reserved
Oct 30 16:37:12 shumail1 kernel: BIOS-e820: [mem 0x000000000000ffef0000-0x000000000000ffffffffffff] reserved
Oct 30 16:37:12 shumail1 kernel: BIOS-e820: [mem 0x000000000000000000-0x000000000000000013ffffff] usable
Oct 30 16:37:12 shumail1 kernel: NX (Execute Disable) protection: active
Oct 30 16:37:12 shumail1 kernel: APIC: Static calls initialized
Oct 30 16:37:12 shumail1 kernel: SMBIOS 2.7 present.
Oct 30 16:37:12 shumail1 kernel: DMI: VMware, Inc. VMware Virtual Platform/440BX Desktop Reference Platform, BIOS 6.00 11/12/2020
Oct 30 16:37:12 shumail1 kernel: vmware: hypercall mode: 0x02
Oct 30 16:37:12 shumail1 kernel: Hypervisor detected: VMware
Oct 30 16:37:12 shumail1 kernel: vmware: TSC freq read from hypervisor : 1895.999 MHz
Oct 30 16:37:12 shumail1 kernel: vmware: Host bus clock speed read from hypervisor : 660000000 Hz
Oct 30 16:37:12 shumail1 kernel: vmware: using clock offset of 7507692094 ns
Oct 30 16:37:12 shumail1 kernel: tsc: Detected 1895.999 MHz processor
Oct 30 16:37:12 shumail1 kernel: e820: update [mem 0x000000000-0x000000ffff] usable => reserved
Oct 30 16:37:12 shumail1 kernel: e820: remove [mem 0x0000a0000-0x0000ffffff] usable
Oct 30 16:37:12 shumail1 kernel: last_pfn = 0x140000 max_arch_pfn = 0x400000000
Oct 30 16:37:12 shumail1 kernel: total RAM covered: 130048M
Oct 30 16:37:12 shumail1 kernel: Found optimal setting for mtrr clean up
Oct 30 16:37:12 shumail1 kernel: gran_size: 64K chunk_size: 64K num_reg: 7 lose cover RAM: 0G
Oct 30 16:37:12 shumail1 kernel: MTRR: map: 7 entries (5 fixed + 2 variable: max 21); built from 8 variable MTRRs
Oct 30 16:37:12 shumail1 kernel: x86/PAT: Configuration [0-7]: WB WB UC WB WB UC WB UC WB UC
Oct 30 16:37:12 shumail1 kernel: e820: update [mem 0xc00000000-0xffffffff] usable => reserved
Oct 30 16:37:12 shumail1 kernel: last_pfn = 0xc0000 max_arch_pfn = 0x400000000
Oct 30 16:37:12 shumail1 kernel: found SMP MP-table at [mem 0x000f6a70-0x000f6aff]
Oct 30 16:37:12 shumail1 kernel: Using GB pages for direct mapping
Oct 30 16:37:12 shumail1 kernel: RAMDISK: [mem 0x2f5cb000-0x33adcfff]
Oct 30 16:37:12 shumail1 kernel: ACPI: Early table checksum verification disabled
Oct 30 16:37:12 shumail1 kernel: ACPI: RSDP 0x000000000000f6a00 000024 (v02 PTLT )
Oct 30 16:37:12 shumail1 kernel: ACPI: XSDT 0x000000000000f6c33 00005c (v01 INTEL 440BX 06040000 VMM 01324272)
student@shumail1:~$ sudo journalctl -u systemd | grep -i error > ~/journal_errors.txt
student@shumail1:~$ _
```

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

task10_b1_vim

```
#!/bin/bash
-- INSERT --
1,12      811
```

task10_b1_run

```
~
~
~
~
~
~
~
~
~
"setup.sh" [New] 1L, 12B written
shumail@shumail1:~$ chmod +x setup.sh
shumail@shumail1:~$ ./setup.sh
shumail@shumail1:~$
```

task10 b2 vim

[illegible]

task10_b2_run

```
"setup.sh" 4L, 78B written  
shumail@shumail1:~$ ./setup.sh  
var1: Hello from Lab 6  
shumail@shumail1:~$
```

task10_b3_vim

```
#!/bin/bash
# Define and show var1
var1="Hello from Lab 6"
echo "var1: $var1"
# Save ls -l to variable and display
allFiles="$(ls -l)"
echo "allFiles (ls -l):"
echo "$allFiles"
```

```
task10 b3 run
```

```

"setup.sh" 8L, 177B written
shumail@shumail1:~$ ./setup.sh
var1: Hello from Lab 6
allFiles (ls -l):
total 526508
-rw-rw-r-- 1 shumail shumail      366 Oct 30 17:18 apt_update_vs_upgrade.md
drwxr-xr-x 2 shumail shumail     4096 Oct 30 19:02 Desktop
-rw-rw-r-- 1 shumail shumail 421490404 Oct 31 18:14 docker-desktop-amd64.deb
drwxr-xr-x 2 shumail shumail     4096 Oct 30 19:02 Documents
drwxr-xr-x 2 shumail shumail     4096 Oct 30 19:02 Downloads
-rw-rw-r-- 1 shumail shumail 117592096 Oct 29 00:37 google-chrome-stable_current_amd64.deb
drwxrwxr-x 2 shumail shumail     4096 Oct 31 15:31 Lab5
drwxr-xr-x 2 shumail shumail     4096 Oct 30 19:02 Music
drwxr-xr-x 2 shumail shumail     4096 Oct 30 19:02 Pictures
drwxr-xr-x 2 shumail shumail     4096 Oct 30 19:02 Public
-rwxrwxr-x 1 shumail shumail      177 Nov  2 17:10 setup.sh
drwx----- 3 shumail shumail     4096 Oct 30 17:44 snap
-rw-r----- 1 shumail shumail     1837 Oct 30 20:01 sss
drwxr-xr-x 2 shumail shumail     4096 Oct 30 19:02 Templates
drwxrwxr-t 2 shumail shumail     4096 Oct 30 19:01 thinclient_drives
drwxr-xr-x 2 shumail shumail     4096 Oct 30 19:02 Videos
shumail@shumail1:~$

```

task10_b4_vim

```

#!/bin/bash
# Define and show var1
var1="Hello from Lab 6"
echo "var1: $var1"
# Save ls -l to variable and display
allFiles=$(ls -l)
echo "allFiles $(ls -l):"
echo "$allFiles"
# 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

-- INSERT --

```

22,3 All

task10_b4_run

```

~
~
~
~
~
"setup.sh" 22L, 385B written
shumail@shumail1:~$ ./setup.sh
var1: Hello from Lab 6
allFiles (ls -l):
total 526508
-rw-rw-r-- 1 shumail shumail      366 Oct 30 17:18 apt_update_vs_upgrade.md
drwxr-xr-x 2 shumail shumail    4096 Oct 30 19:02 Desktop
-rw-rw-r-- 1 shumail shumail 421490404 Oct 31 18:14 docker-desktop-amd64.deb
drwxr-xr-x 2 shumail shumail    4096 Oct 30 19:02 Documents
drwxr-xr-x 2 shumail shumail    4096 Oct 30 19:02 Downloads
-rw-rw-r-- 1 shumail shumail 117592096 Oct 29 00:37 google-chrome-stable_current_amd64.deb
drwxrwxr-x 2 shumail shumail    4096 Oct 31 15:31 Lab5
drwxr-xr-x 2 shumail shumail    4096 Oct 30 19:02 Music
drwxr-xr-x 2 shumail shumail    4096 Oct 30 19:02 Pictures
drwxr-xr-x 2 shumail shumail    4096 Oct 30 19:02 Public
-rwxrwxr-x 1 shumail shumail      385 Nov  2 17:12 setup.sh
drwx----- 3 shumail shumail    4096 Oct 30 17:44 snap
-rw-r--r-- 1 shumail shumail   1837 Oct 30 20:01 sss
drwxr-xr-x 2 shumail shumail    4096 Oct 30 19:02 Templates
drwxrwxr-t 2 shumail shumail    4096 Oct 30 19:01 thinclient_drives
drwxr-xr-x 2 shumail shumail    4096 Oct 30 19:02 Videos
Directory dir1 does not exist. Creating...
Directory dir1 created.
shumail@shumail1:~$

```

task10_b5_vim.

```

# Define and show var1
var1="Hello from Lab 6"
echo "var1: $var1"
# Save ls -l to variable and display
allFiles="$(ls -l)"
echo "allFiles (ls -l):"
echo "$allFiles"
# 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
# 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
~
~
~
~
~
~
~
~
~
~
"setup.sh" 39L, 609B written
shumail@shumail1:~$

```

task10 b5 run

```

~
~
~
~
~
~
"setup.sh" 39L, 609B written
shumail@shumail1:~$ ./setup.sh
var1: Hello from Lab 6
allFiles (ls -l):
total 526512
-rw-rw-r-- 1 shumail shumail      366 Oct 30 17:18 apt_update_vs_upgrade.md
drwxr-xr-x 2 shumail shumail    4096 Oct 30 19:02 Desktop
drwxrwxr-x 2 shumail shumail    4096 Nov  2 17:12 dir1
-rw-rw-r-- 1 shumail shumail 421490404 Oct 31 18:14 docker-desktop-amd64.deb
drwxr-xr-x 2 shumail shumail    4096 Oct 30 19:02 Documents
drwxr-xr-x 2 shumail shumail    4096 Oct 30 19:02 Downloads
-rw-rw-r-- 1 shumail shumail 117592096 Oct 29 00:37 google-chrome-stable_current_amd64.deb
drwxrwxr-x 2 shumail shumail    4096 Oct 31 15:31 Lab5
drwxr-xr-x 2 shumail shumail    4096 Oct 30 19:02 Music
drwxr-xr-x 2 shumail shumail    4096 Oct 30 19:02 Pictures
drwxr-xr-x 2 shumail shumail    4096 Oct 30 19:02 Public
-rwxrwxr-x 1 shumail shumail      609 Nov  2 17:14 setup.sh
drwx----- 3 shumail shumail    4096 Oct 30 17:44 snap
-rw-r--r-- 1 shumail shumail    1837 Oct 30 20:01 sss
drwxr-xr-x 2 shumail shumail    4096 Oct 30 19:02 Templates
drwxrwxr-t 2 shumail shumail    4096 Oct 30 19:01 thinclient_drives
drwxr-xr-x 2 shumail shumail    4096 Oct 30 19:02 Videos
Directory dir1 exists.
file2 does not exist. Creating...
file2 created.
shumail@shumail1:~$ _

```

task10 b6 vim

```
echo "File created."

fi

# Permission checks for dir1/file2 (user permissions)
f="dir1/file2"

if [ ! -r "$f" ]; then

    echo "Read permission missing; granting to user..."

    chmod u+r "$f"

fi

if [ ! -w "$f" ]; then

    echo "Write permission missing; granting to user..."

    chmod u+w "$f"

fi

if [ ! -x "$f" ]; then

    echo "Execute permission missing; granting to user..."

    chmod u+x "$f"

fi

echo "Final permissions for $f:"

ls -l "$f"

:wq_
```

+G.

task10 b6 run

```
echo "Final permissions for $f:"

ls -l "$f"
"setup.sh" 74L, 1048B written
shumail@shumail1:~$ ./setup.sh
var1: Hello from Lab 6
allFiles (ls -l):
total 526512
-rw-rw-r-- 1 shumail shumail      366 Oct 30 17:18 apt_update_vs_upgrade.md
drwxr-xr-x 2 shumail shumail     4096 Oct 30 19:02 Desktop
drwxrwxr-x 2 shumail shumail     4096 Nov  2 17:18 dir1
-rw-rw-r-- 1 shumail shumail 421490404 Oct 31 18:14 docker-desktop-amd64.deb
drwxr-xr-x 2 shumail shumail     4096 Oct 30 19:02 Documents
drwxr-xr-x 2 shumail shumail     4096 Oct 30 19:02 Downloads
-rw-rw-r-- 1 shumail shumail 117592096 Oct 29 00:37 google-chrome-stable_current_amd64.deb
drwxrwxr-x 2 shumail shumail     4096 Oct 31 15:31 Lab5
drwxr-xr-x 2 shumail shumail     4096 Oct 30 19:02 Music
drwxr-xr-x 2 shumail shumail     4096 Oct 30 19:02 Pictures
drwxr-xr-x 2 shumail shumail     4096 Oct 30 19:02 Public
-rwxrwxr-x 1 shumail shumail     1048 Nov  2 17:21 setup.sh
drwx----- 3 shumail shumail     4096 Oct 30 17:44 snap
-rw-r--r-- 1 shumail shumail    1837 Oct 30 20:01 sss
drwxr-xr-x 2 shumail shumail     4096 Oct 30 19:02 Templates
drwxrwxr-t 2 shumail shumail     4096 Oct 30 19:01 thinclient_drives
drwxr-xr-x 2 shumail shumail     4096 Oct 30 19:02 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 shumail shumail 0 Nov  2 17:18 dir1/file2
shumail@shumail1:~$ _
```

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

```
#!/bin/bash
num=$1
str=$2
```

```
"setup.sh" 3L, 26B written
shumail@shumail1:~$ chmod +x setup.sh
shumail@shumail1:~$ ./setup.sh 10 Student
shumail@shumail1:~$
```


$rl+G.$

```
"setup.sh" 22L, 286B written
shumail@shumail1:~$ ./setup.sh 7 Student
7 is NOT equal to 10 (-eq).
7 is not equal to 10 (-ne).
shumail@shumail1:~$ ./setup.sh 10 Student
10 is equal to 10 (-eq).
10 is equal to 10 (-ne false).
shumail@shumail1:~$
shumail@shumail1:~$
```



```

#!/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
if [ \"$num\" -gt 10 ]; then
    echo \"$num is greater than 10 (-gt).\"

else
    echo \"$num is NOT greater than 10 (-gt).\"

fi
if [ \"$num\" -lt 10 ]; then
    echo \"$num is less than 10 (-lt).\"

else
    echo \"$num is NOT less than 10 (-lt).\"

fi
~
~
~
~
~
~
~
~
~
:wq

~
~
~
~
~
~
~

"setup.sh" 40L, 538B written
shumail@shumail1:~$ ./setup.sh 5 Student
5 is NOT equal to 10 (-eq).
5 is not equal to 10 (-ne).
5 is NOT greater than 10 (-gt).
5 is less than 10 (-lt).
shumail@shumail1:~$ ./setup.sh 11 Student
11 is NOT equal to 10 (-eq).
11 is not equal to 10 (-ne).
11 is greater than 10 (-gt).
11 is NOT less than 10 (-lt).
shumail@shumail1:~$ _

```

```
#!/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

if [ "$num" -gt 10 ]; then
    echo "$num is greater than 10 (-gt)."
```

```

else
    echo "$num is NOT greater than 10 (-gt)."
```

```

fi

if [ "$num" -lt 10 ]; then
    echo "$num is less than 10 (-lt)."
```

```

else
    echo "$num is NOT less than 10 (-lt)."
```

```

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
:wq_
```

```

fi
"setup.sh" 49L, 691B written
shumail@shumail1:~$ ./setup.sh 10 Student
10 is equal to 10 (-eq).
10 is equal to 10 (-ne false).
10 is NOT greater than 10 (-gt).
10 is NOT less than 10 (-lt).
10 is greater than or equal to 10 (-ge).
shumail@shumail1:~$ ./setup.sh 8 Student
8 is NOT equal to 10 (-eq).
8 is not equal to 10 (-ne).
8 is NOT greater than 10 (-gt).
8 is less than 10 (-lt).
8 is NOT greater than or equal to 10 (-ge).
shumail@shumail1:~$
```

```

        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

```

if [ "$num" -gt 10 ]; then
    echo "$num is greater than 10 (-gt)."
```

else

```

    echo "$num is NOT greater than 10 (-gt)."
```

fi

```

if [ "$num" -lt 10 ]; then
    echo "$num is less than 10 (-lt)."
```

else

```

    echo "$num is NOT less than 10 (-lt)."
```

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 [ "$num" -le 10 ]; then
    echo "$num is less than or equal to 10 (-le)."
```

else

```

    echo "$num is NOT less than or equal to 10 (-le)."
```

fi

```

:wq
```

```

fi
"setup.sh" 58L, 838B written
shumail@shumail1:~$ ./setup.sh 10 Student
10 is equal to 10 (-eq).
10 is equal to 10 (-ne false).
10 is NOT greater than 10 (-gt).
10 is NOT less than 10 (-lt).
10 is greater than or equal to 10 (-ge).
10 is less than or equal to 10 (-le).
shumail@shumail1:~$ ./setup.sh 12 Student
12 is NOT equal to 10 (-eq).
12 is not equal to 10 (-ne).
12 is greater than 10 (-gt).
12 is NOT less than 10 (-lt).
12 is greater than or equal to 10 (-ge).
12 is NOT less than or equal to 10 (-le).
shumail@shumail1:~$
```

```

fi
if [ "$num" -le 10 ]; then
    echo "$num is less than or equal to 10 (-le)."
else
    echo "$num is NOT less than or equal to 10 (-le)."
fi
if [ "$str" = "Student" ]; then
    echo "Second argument equals 'Student' ( = )."
else
    echo "Second argument does NOT equal 'Student' ( = )."
fi
:wq_

    echo "Second argument does NOT equal 'Student' ( = )."

fi
"setup.sh" 67L, 994B written
shumail@shumail1:~$ ./setup.sh 10 Student
10 is equal to 10 (-eq).
10 is equal to 10 (-ne false).
10 is NOT greater than 10 (-gt).
10 is NOT less than 10 (-lt).
10 is greater than or equal to 10 (-ge).
10 is less than or equal to 10 (-le).
Second argument equals 'Student' ( = ).
shumail@shumail1:~$ ./setup.sh 10 Test
10 is equal to 10 (-eq).
10 is equal to 10 (-ne false).
10 is NOT greater than 10 (-gt).
10 is NOT less than 10 (-lt).
10 is greater than or equal to 10 (-ge).
10 is less than or equal to 10 (-le).
Second argument does NOT equal 'Student' ( = ).
shumail@shumail1:~$

```

```

    echo "Second argument does NOT equal 'Student' ( = )."

fi
if [ "$str" != "Student" ]; then
    echo "Second argument is not equal to 'Student' ( != )."
else
    echo "Second argument equals 'Student' ( != false)."
```

```

fi
:wq

```

```

        echo "Second argument equals 'Student' ( != false)."
```

```

fi
"setup.sh" 76L, 1159B written
shumail@shumail1:~$ ./setup.sh 10 Test
10 is equal to 10 (-eq).
10 is equal to 10 (-ne false).
10 is NOT greater than 10 (-gt).
10 is NOT less than 10 (-lt).
10 is greater than or equal to 10 (-ge).
10 is less than or equal to 10 (-le).
Second argument does NOT equal 'Student' ( = ).
Second argument is not equal to 'Student' ( != ).
shumail@shumail1:~$
shumail@shumail1:~$ ./setup.sh 10 Student
10 is equal to 10 (-eq).
10 is equal to 10 (-ne false).
10 is NOT greater than 10 (-gt).
10 is NOT less than 10 (-lt).
10 is greater than or equal to 10 (-ge).
10 is less than or equal to 10 (-le).
Second argument equals 'Student' ( = ).
Second argument equals 'Student' ( != false).
shumail@shumail1:~$ _
```

```

fi
if [ "$str" != "Student" ]; then

    echo "Second argument is not equal to 'Student' ( != )."

else

    echo "Second argument equals 'Student' ( != false)."
```

```

fi
if [ -z "$str" ]; then

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

```

else

    echo "Second argument is not empty."
```

```

fi
:wq
```

```

else
```

```

    echo "Second argument is not empty."
```

```

fi
"setup.sh" 85L, 1288B written
shumail@shumail1:~$ ./setup.sh 10
10 is equal to 10 (-eq).
10 is equal to 10 (-ne false).
10 is NOT greater than 10 (-gt).
10 is NOT less than 10 (-lt).
10 is greater than or equal to 10 (-ge).
10 is less than or equal to 10 (-le).
Second argument does NOT equal 'Student' ( = ).
Second argument is not equal to 'Student' ( != ).
Second argument is empty (zero-length).
shumail@shumail1:~$ ./setup.sh 10 Student
10 is equal to 10 (-eq).
10 is equal to 10 (-ne false).
10 is NOT greater than 10 (-gt).
10 is NOT less than 10 (-lt).
10 is greater than or equal to 10 (-ge).
10 is less than or equal to 10 (-le).
Second argument equals 'Student' ( = ).
Second argument equals 'Student' ( != false).
Second argument is not empty.
shumail@shumail1:~$
```

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

task12_b1_vim

```
"setup.sh" 2L, 80B written  
shumail@shumail1:~$ ./setup.sh  
shumail@shumail1:~$
```

task12_b2_vim

```
task12 b2 run
```

```
~  
~  
~  
~  
~  
~  
~  
~  
~  
~  
  
"setup.sh" 10L, 206B written  
shumail@shumail1:~$ chmod +x setup.sh  
shumail@shumail1:~$ ./setup.sh one "two words" three  
Printing all arguments using $*:  
./setup.sh: line 10: unexpected EOF while looking for matching `'  
shumail@shumail1:~$
```

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

task13_b1_vim

[illegible]

```
~  
~  
~  
~  
~  
~  
~  
~  
~  
~  
~  
~  
~  
~  
~  
  
"setup.sh" 23L, 299B written  
shumail@shumail1:~$ ./setup.sh  
Enter a number (or 'q' to quit): 5  
Total Score: 5  
Enter a number (or 'q' to quit): 7  
Total Score: 12  
Enter a number (or 'q' to quit): quit  
Total Score: 12  
Enter a number (or 'q' to quit): q  
Final total: 12  
shumail@shumail1:~$ _
```

```

        echo "Final total: $sum"
    # Function to accumulate scores interactively
    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"

        }

    # Demonstrate the function
    echo "Now calling sum_two function:"

    sum_two
    :wd_

```

task13 b3 run

```
shumail@shumail1:~$ ./setup.sh
Enter a number (or 'q' to quit): 5
Total Score: 5
Enter a number (or 'q' to quit): 7
Total Score: 12
Enter a number (or 'q' to quit): q
Final total: 12
Now calling sum_two function:
Enter a number (or 'q' to quit): 3
Total Score: 3
Enter a number (or 'q' to quit): 4
Total Score: 7
Enter a number (or 'q' to quit): q
Function final total: 7
shumail@shumail1:~$
```

task13 b4 vim

```
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"
}

# Demonstrate the function
echo "Now calling sum_two function:"

sum_two
# Function that sums two arguments and returns the result
sum_args() {
    a=$1
    b=$2
    return $((a + b))
}

# Demonstrate sum_args function
echo "Now demonstrating sum_args function:"

sum_args 3 4

result=$?
echo "sum_args(3,4) returned: $result"

~
~
:wq
```

task13 b4 run

```
result=$?  
  
echo "sum_args(3,4) returned: $result"  
~  
~  
"setup.sh" 74L, 1047B written  
shumail@shumail1:~$ chmod +x setup.sh  
shumail@shumail1:~$ ./setup.sh  
Enter a number (or 'q' to quit): 5  
Total Score: 5  
Enter a number (or 'q' to quit): 7  
Total Score: 12  
Enter a number (or 'q' to quit): q  
Final total: 12  
Now calling sum_two function:  
Enter a number (or 'q' to quit): 3  
Total Score: 3  
Enter a number (or 'q' to quit): 4  
Total Score: 7  
Enter a number (or 'q' to quit): q  
Function final total: 7  
Now demonstrating sum_args function:  
sum_args(3,4) returned: 7  
shumail@shumail1:~$ _
```

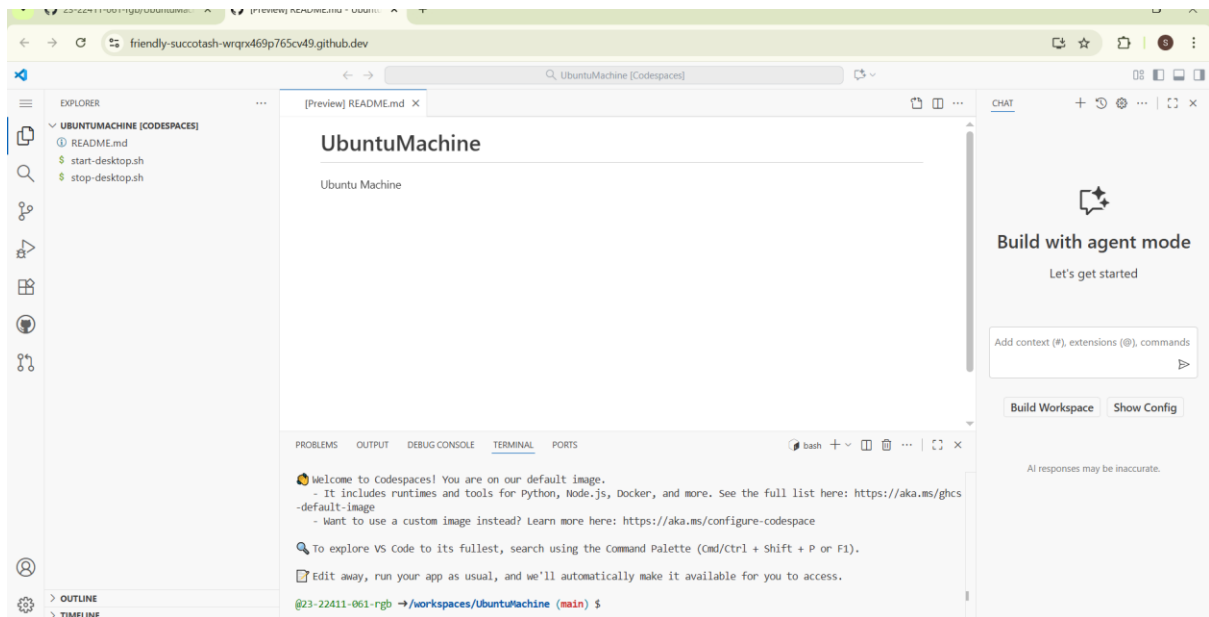
Ctrl+G.

Task 14 – Codespaces GUI — fork repo, run start-desktop.sh, open VNC, stop GUI

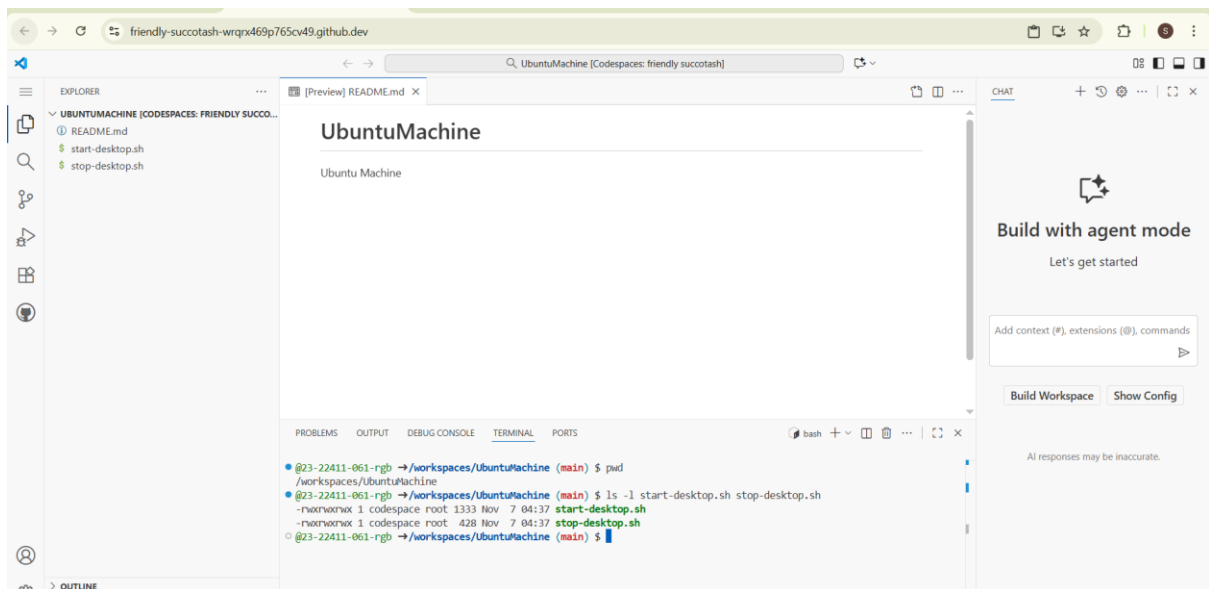
task14_fork

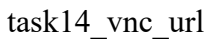
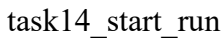
The screenshot shows the GitHub 'Create a new fork' page for the repository 'UbuntuMachine' by 'WaqasSaleem97'. The page includes a search bar, navigation links (Code, Issues, Pull requests, Actions, Projects, Security, Insights), and a 'Create a new fork' section. The 'Owner' is '23-22411-061-rgb' and the 'Repository name' is 'UbuntuMachine'. A message states 'UbuntuMachine is available.' Below this, there is a 'Description' field (0 / 350 characters) and a checkbox 'Copy the main branch only' which is checked. A note at the bottom says 'You are creating a fork in your personal account.' and a green 'Create fork' button is at the bottom right.

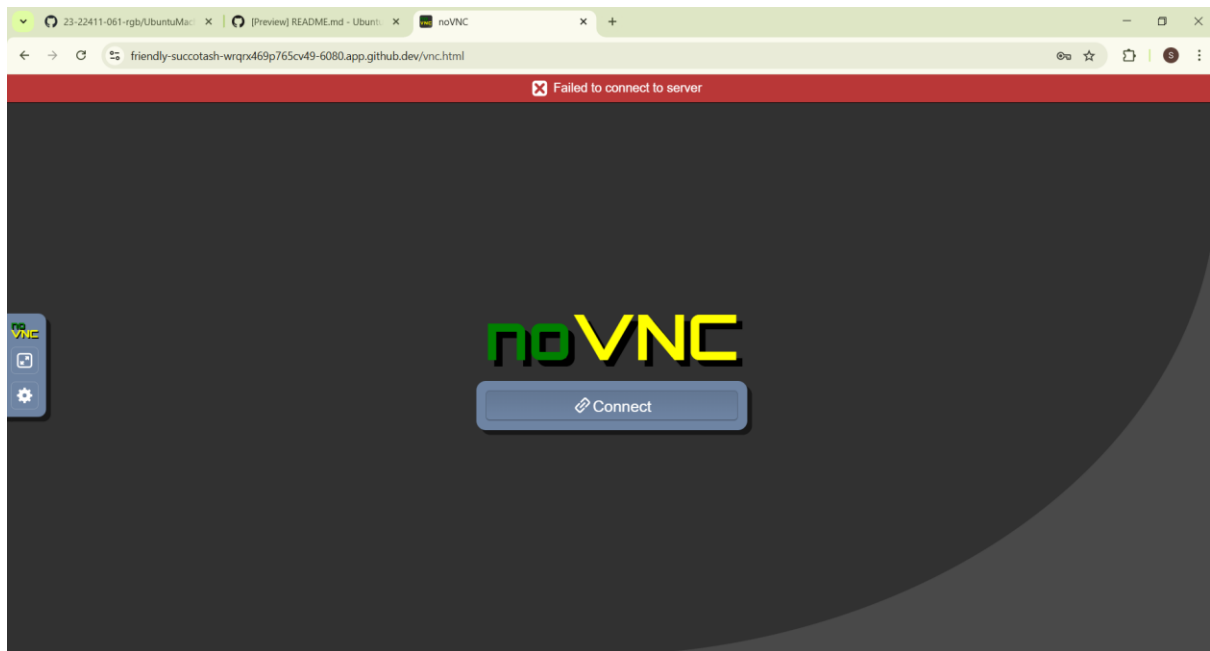
task14_codespace_launch



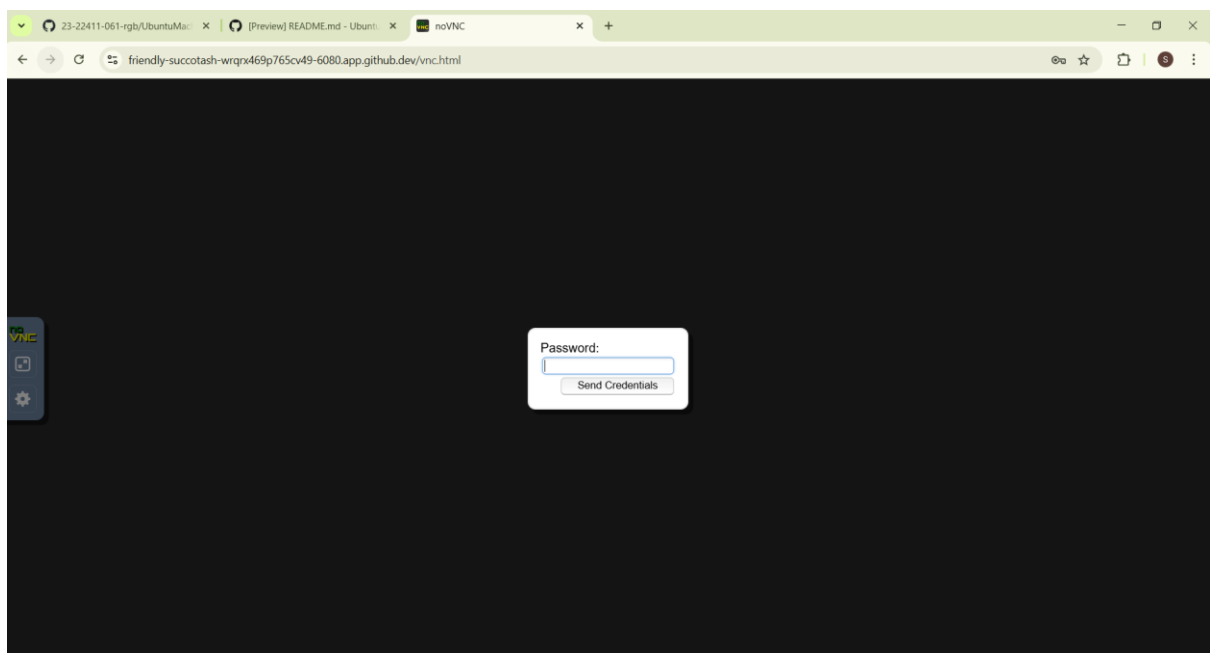
task14_start_script_ls



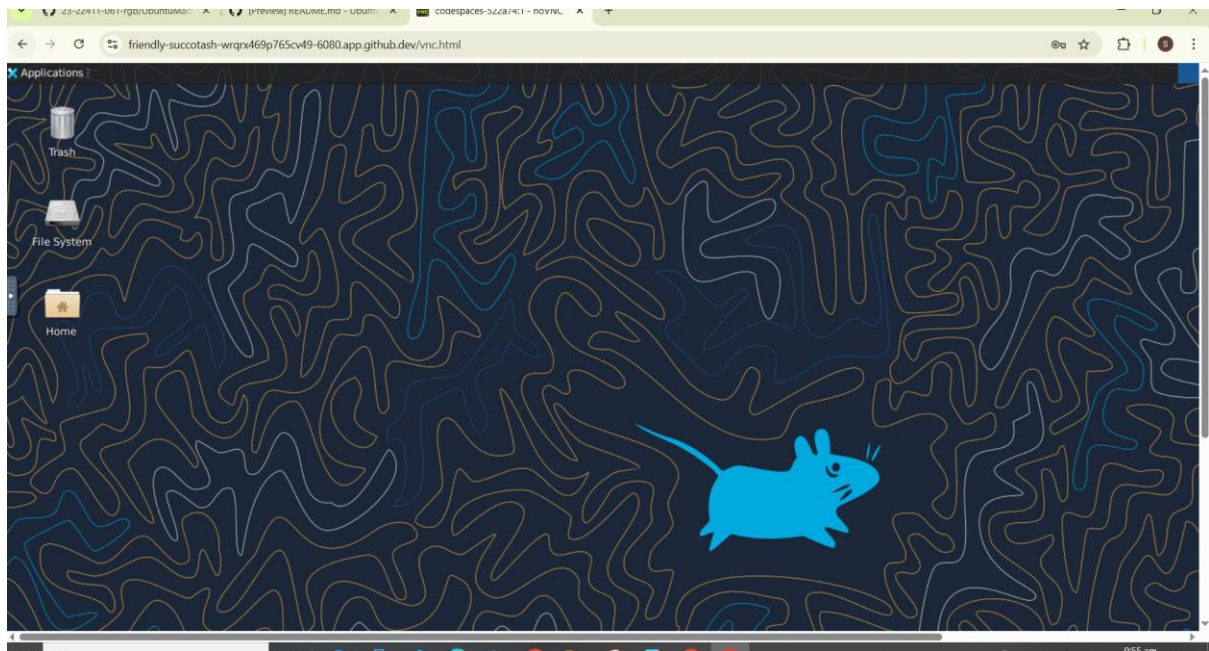




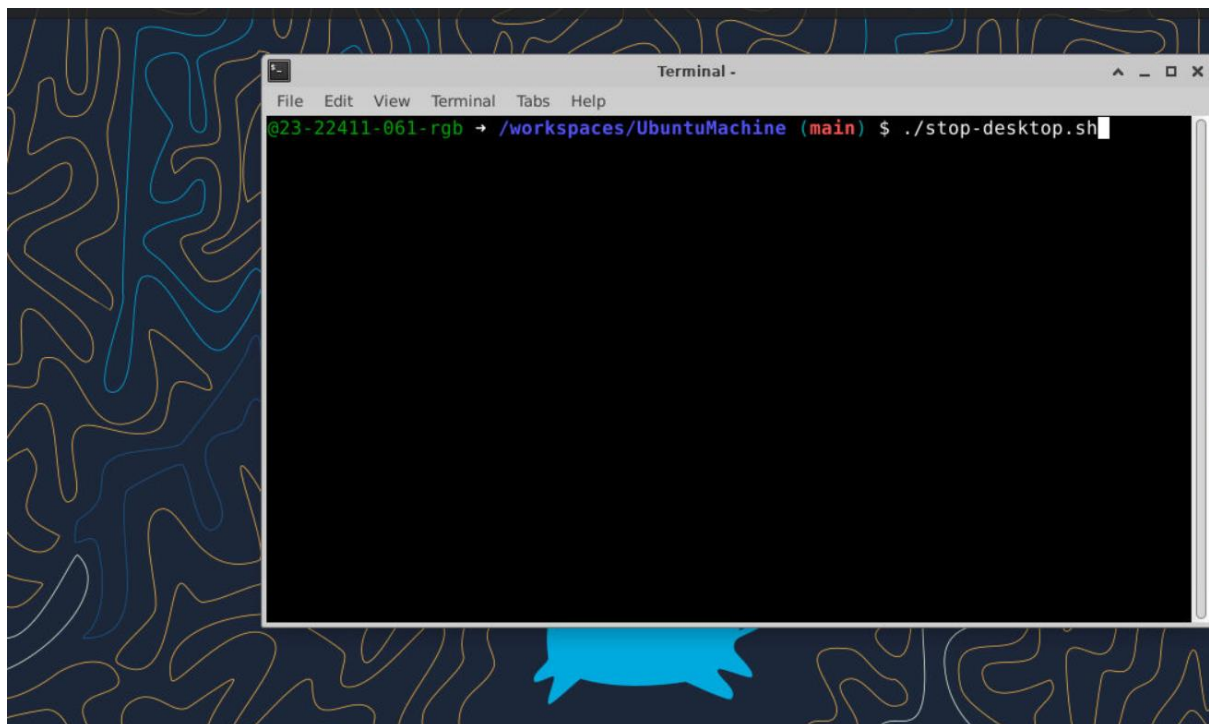
task14_vnc_password_prompt



task14_vnc_desktop



task14_stop_run



Exam Evaluation Questions

1. Group Management and Membership

Q1_groups_created

```

sum_args(3,4) returned: 7
shumail@shumail1:~$ sudo groupadd g1
[sudo] password for shumail:
shumail@shumail1:~$ sudo groupadd g2
shumail@shumail1:~$ sudo groupadd g3
shumail@shumail1:~$ getent group | grep g
adm:x:4:syslog,shumail
plugdev:x:46:shumail
games:x:60:
nogroup:x:65534:
sgx:x:995:
messagebus:x:102:
syslog:x:104:
lightdm:x:115:
nopasswdlogin:x:116:
designer:x:1004:
g1:x:1006:
g2:x:1007:
g3:x:1008:
shumail@shumail1:~$ _

```

Q1_group changes

```

shumail@shumail1:~$ sudo useradd examuser

shumail@shumail1:~$ sudo usermod -g g3 examuser
shumail@shumail1:~$ sudo usermod -aG g1,g2 examuser
shumail@shumail1:~$ _

```

Q1_group verification

```

shumail@shumail1:~$ id examuser
uid=1006(examuser) gid=1008(g3) groups=1008(g3),1006(g1),1007(g2)
shumail@shumail1:~$ grep examuser /etc/group
g1:x:1006:examuser
g2:x:1007:examuser
examuser:x:1009:
shumail@shumail1:~$

```

2. Ownership and Permission Tasks

Q2_chown_chgrp

```

shumail@shumail1:~$ mkdir -p ~/workspace
shumail@shumail1:~$ touch ~/workspace/secret.txt
shumail@shumail1:~$ sudo chown examuser ~/workspace/secret.txt
shumail@shumail1:~$ sudo chgrp g1 ~/workspace/secret.txt
shumail@shumail1:~$ ls -l ~/workspace/secret.txt
-rw-rw-r-- 1 examuser g1 0 Nov  3 11:27 /home/shumail/workspace/secret.txt
shumail@shumail1:~$ _

```

Q2 symbolic numeric

```
shumail@shumail1:~$ chmod go-rwx ~/workspace/secret.txt
chmod: changing permissions of '/home/shumail/workspace/secret.txt': Operation not permitted
shumail@shumail1:~$ sudo chmod go-rwx ~/workspace/secret.txt
shumail@shumail1:~$ ls -l ~/workspace/secret.txt
-rw----- 1 examuser g1 0 Nov  3 11:27 /home/shumail/workspace/secret.txt
shumail@shumail1:~$
```

Q2_permissions_ls

```
shumail@shumail1:~$ sudo chmod 700 ~/workspace/secret.txt
shumail@shumail1:~$ ls -l ~/workspace/secret.txt
-rwx----- 1 examuser g1 0 Nov  3 11:27 /home/shumail/workspace/secret.txt
shumail@shumail1:~$
```

3. Pipes, Grep, and Redirection Practice

Q3_grep_pipe

```
shumail@shumail1:~$ sudo grep -Ei "error|fail" /var/log/syslog | head -n 20
2025-11-02T11:40:38.197704+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.197519039Z" level=info msg="skip loading plugin '\io.containerd.snapshotter.v1.aufs'" error="aufs is not supported (modprobe aufs failed: exit status 1 '\modprobe: FATAL: Module aufs not found in directory /lib/modules/6.8.0-87-generloc\n\n'): skip plugin" type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.199207+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.198905937Z" level=info msg="skip loading plugin '\io.containerd.snapshotter.v1.blockfile'" error="no scratch file generator: skip plugin" type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.199260+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.199075101Z" level=info msg="skip loading plugin '\io.containerd.snapshotter.v1.btrfs'" error="path /var/lib/containerd/io.containerd.snapshotter.v1.btrfs (ext4) must be a btrfs filesystem to be used with the btrfs snapshotter: skip plugin" type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.199295+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.199100265Z" level=info msg="skip loading plugin '\io.containerd.snapshotter.v1.devmapper'" error="devmapper not configured: skip plugin" type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.200529+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.200216468Z" level=info msg="skip loading plugin '\io.containerd.snapshotter.v1.zfs'" error="path /var/lib/containerd/io.containerd.snapshotter.v1.zfs must be a zfs filesystem to be used with the zfs snapshotter: skip plugin" type=io.containerd.snapshotter.v1
2025-11-02T11:40:38.200710+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.200466076Z" level=info msg="skip loading plugin '\io.containerd.tracing.processor.v1.otlp'" error="skip plugin: tracing endpoint not configured" type=io.containerd.tracing.processor.v1
2025-11-02T11:40:38.207278+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.206486857Z" level=info msg="skip loading plugin '\io.containerd.internal.v1.tracing'" error="skip plugin: tracing endpoint not configured" type=io.containerd.internal.v1
2025-11-02T11:40:38.861201+00:00 shumail1 dockerd[1475]: time="2025-11-02T11:40:38.860661903Z" level=info msg="CDI directory does not exist, skipping: failed to monitor for changes: no such file or directory" dir=/var/run/cdi
2025-11-02T11:40:38.861238+00:00 shumail1 dockerd[1475]: time="2025-11-02T11:40:38.860684309Z" level=info msg="CDI directory does not exist, skipping: failed to monitor for changes: no such file or directory" dir=/etc/cdi
2025-11-02T11:40:42.391239+00:00 shumail1 multipathd[479]: sda: failed to get sysfs uid: No such file or directory
2025-11-02T11:40:42.391318+00:00 shumail1 multipathd[479]: sda: failed to get sgio uid: No such file or directory
2025-11-02T11:40:42.413380+00:00 shumail1 multipathd[479]: sda: failed to get udev uid: No data available
2025-11-02T11:40:42.413495+00:00 shumail1 multipathd[479]: sda: failed to get path uid
2025-11-02T11:40:42.413451+00:00 shumail1 multipathd[479]: uevent trigger error
2025-11-02T11:40:52.352762+00:00 shumail1 multipathd[479]: sda: failed to get sysfs uid: No such file or directory
2025-11-02T11:40:52.353513+00:00 shumail1 multipathd[479]: sda: failed to get sgio uid: No such file or directory
2025-11-02T11:40:52.364990+00:00 shumail1 multipathd[479]: sda: failed to get udev uid: No data available
2025-11-02T11:40:52.364161+00:00 shumail1 multipathd[479]: sda: failed to get path uid
2025-11-02T11:40:52.364242+00:00 shumail1 multipathd[479]: uevent trigger error
2025-11-02T11:41:02.358437+00:00 shumail1 multipathd[479]: sda: failed to get sysfs uid: No such file or directory
shumail@shumail1:~$ _
```

Q3_redirect overwrite append

```
shumail@shumail1:~$ mkdir -p ~/logs
shumail@shumail1:~$ sudo grep -Ei "error|fail" /var/log/syslog > ~/logs/errors.txt
grep: /var/log/syslog: binary file matches
shumail@shumail1:~$ sudo grep -Ei "warn|critical" /var/log/syslog >> ~/logs/errors.txt
grep: /var/log/syslog: binary file matches
shumail@shumail1:~$ _
```

Q3 pager view

```
shumail@shumail1:~$ less ~/logs/errors.txt_
```

```
2025-11-02T16:57:02.229250+00:00 shumail1 kernel: pci 0000:00:10.2: bridge window [io size 0x1000]: failed to assign
2025-11-02T16:57:02.229252+00:00 shumail1 kernel: pci 0000:00:17.7: bridge window [io size 0x1000]: failed to assign
2025-11-02T16:57:02.229253+00:00 shumail1 kernel: pci 0000:00:17.6: bridge window [io size 0x1000]: failed to assign
2025-11-02T16:57:02.229255+00:00 shumail1 kernel: pci 0000:00:17.5: bridge window [io size 0x1000]: failed to assign
2025-11-02T16:57:02.229257+00:00 shumail1 kernel: pci 0000:00:17.4: bridge window [io size 0x1000]: failed to assign
2025-11-02T16:57:02.229258+00:00 shumail1 kernel: pci 0000:00:17.3: bridge window [io size 0x1000]: failed to assign
2025-11-02T16:57:02.229260+00:00 shumail1 kernel: pci 0000:00:16.7: bridge window [io size 0x1000]: failed to assign
2025-11-02T16:57:02.229261+00:00 shumail1 kernel: pci 0000:00:16.6: bridge window [io size 0x1000]: failed to assign
2025-11-02T16:57:02.229263+00:00 shumail1 kernel: pci 0000:00:16.5: bridge window [io size 0x1000]: failed to assign
2025-11-02T16:57:02.229264+00:00 shumail1 kernel: pci 0000:00:16.4: bridge window [io size 0x1000]: failed to assign
2025-11-02T16:57:02.229265+00:00 shumail1 kernel: pci 0000:00:16.3: bridge window [io size 0x1000]: failed to assign
2025-11-02T16:57:02.229267+00:00 shumail1 kernel: pci 0000:00:15.7: bridge window [io size 0x1000]: failed to assign
2025-11-02T16:57:02.229269+00:00 shumail1 kernel: pci 0000:00:15.6: bridge window [io size 0x1000]: failed to assign
2025-11-02T16:57:02.229271+00:00 shumail1 kernel: pci 0000:00:15.5: bridge window [io size 0x1000]: failed to assign
2025-11-02T16:57:02.229272+00:00 shumail1 kernel: pci 0000:00:15.4: bridge window [io size 0x1000]: failed to assign
2025-11-02T16:57:02.229274+00:00 shumail1 kernel: pci 0000:00:15.3: bridge window [io size 0x1000]: failed to assign
2025-11-02T16:57:02.236573+00:00 shumail1 kernel: RAS: Correctable Errors collector initialized.
2025-11-02T16:57:06.718712+00:00 shumail1 NetworkManager[876]: <Info> [1762102626.7004] failed to open /run/network/lfstate
2025-11-02T16:57:07.280123+00:00 shumail1 systemd[1]: Started update-notifier-download.timer - Download data for packages that failed at package install time.
2025-11-02T16:57:07.776782+00:00 shumail1 multipath: sda: failed to get sysfs uid: No such file or directory
2025-11-02T16:57:07.780139+00:00 shumail1 multipath: sda: failed to get sgio uid: No such file or directory
2025-11-02T16:57:07.976425+00:00 shumail1 multipathd[477]: sda: failed to get udev uid: No data available
2025-11-02T16:57:07.975724+00:00 shumail1 multipathd[477]: sda: failed to get path uid
2025-11-02T16:57:07.980025+00:00 shumail1 multipathd[477]: uevent: trigger error
2025-11-02T16:57:10.135646+00:00 shumail1 containerd[1283]: time="2025-11-02T16:57:10.1180895642" level=info msg="skip loading plugin \"io.containerd.snapshotte
r.v1.aufs\"..." error="aufs is not supported (modprobe aufs failed: exit status 1 \"modprobe: FATAL: Module aufs not found in directory /lib/modules/6.8.0-87-ge
neric\\n\\n\"): skip plugin" type=io.containerd.snapshottter.v1
2025-11-02T16:57:10.137320+00:00 shumail1 containerd[1283]: time="2025-11-02T16:57:10.12412651202" level=info msg="skip loading plugin \"io.containerd.snapshotte
r.v1.btrfs\"..." error="path /var/lib/containerd/io.containerd.snapshottter.v1.btrfs (ext4) must be a btrfs filesystem to be used with the btrfs snapshotter: ski
p plugin" type=io.containerd.snapshottter.v1
2025-11-02T16:57:10.138487+00:00 shumail1 containerd[1283]: time="2025-11-02T16:57:10.1234109272" level=info msg="skip loading plugin \"io.containerd.snapshotte
r.v1.devanper\"..." error="devanper not configured: skip plugin" type=io.containerd.snapshottter.v1
2025-11-02T16:57:10.139753+00:00 shumail1 containerd[1283]: time="2025-11-02T16:57:10.1263115972" level=info msg="skip loading plugin \"io.containerd.snapshotte
r.v1.zfs\"..." error="path /var/lib/containerd/io.containerd.snapshottter.v1.zfs must be a zfs filesystem to be used with the zfs snapshotter: skip plugin" type=
io.containerd.snapshottter.v1
2025-11-02T16:57:10.165592+00:00 shumail1 containerd[1283]: time="2025-11-02T16:57:10.1442159422" level=info msg="skip loading plugin \"io.containerd.tracing.pr
ocessor.v1.otlp\"..." error="skip plugin: tracing endpoint not configured" type=io.containerd.tracing.processor.v1
2025-11-02T16:57:10.167332+00:00 shumail1 containerd[1283]: time="2025-11-02T16:57:10.1443061852" level=info msg="skip loading plugin \"io.containerd.internal.v
1.tracing\"..." error="skip plugin: tracing endpoint not configured" type=io.containerd.internal.v1
2025-11-02T11:40:38.166994+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:382" level=warning msg="containerd config version '1' has been deprecated and
will be converted on each startup in containerd v2.0, use 'containerd config migrate' after upgrading to containerd 2.0 to avoid conversion on startup"
2025-11-02T11:40:38.198495+00:00 shumail1 containerd[1369]: time="2025-11-02T11:40:38.1983657952" level=info msg="loading plugin \"io.containerd.warnings.v1.depr
ecations\"..." type=io.containerd.warnings.v1
2025-11-02T16:57:09.946946+00:00 shumail1 containerd[1283]: time="2025-11-02T16:57:092" level=warning msg="containerd config version '1' has been deprecated and
will be converted on each startup in containerd v2.0, use 'containerd config migrate' after upgrading to containerd 2.0 to avoid conversion on startup"
2025-11-02T16:57:10.136593+00:00 shumail1 containerd[1283]: time="2025-11-02T16:57:10.1200296532" level=info msg="loading plugin \"io.containerd.warnings.v1.depr
ecations\"..." type=io.containerd.warnings.v1
[END]
```

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

Q4_step1_var1

```
#!/bin/bash
var1="Hello Linux"
echo "$var1"
```

```
"setup.sh" 3L, 45B written
shumail@shumail1:~$ chmod +x setup.sh
shumail@shumail1:~$ ./setup.sh
Hello Linux
shumail@shumail1:~$ _
```

Q4_step2_allfiles

```

"setup.sh" 8L, 115B written
shumail@shumail1:~$ setup.sh
setup.sh: command not found
shumail@shumail1:~$ ./setup.sh
Hello Linux
All files in current directory:
total 526520
-rw-rw-r-- 1 shumail shumail
drwxr-xr-x 2 shumail shumail
drwxrwxr-x 2 shumail shumail
-rw-rw-r-- 1 shumail shumail 42
drwxr-xr-x 2 shumail shumail
drwxr-xr-x 2 shumail shumail
-rw-rw-r-- 1 shumail shumail 11
drwxrwxr-x 2 shumail shumail
drwxrwxr-x 2 shumail shumail
drwxr-xr-x 2 shumail shumail
drwxr-xr-x 2 shumail shumail
-rwxrwxr-x 1 shumail shumail
drwxr----- 3 shumail shumail
-rw-r--r-- 1 shumail shumail
drwxr-xr-x 2 shumail shumail
drwxrwxr-t 2 shumail shumail
drwxr-xr-x 2 shumail shumail
drwxrwxr-x 2 shumail shumail
shumail@shumail1:~$ _

```

Q4_step3_dirfile_checks

[illegible]

5. Script: Comparisons and String Tests

Q5_eq_examples

```
shumail@shumail1:~$ ./setup.sh 5 test
Equal to 5
shumail@shumail1:~$ ./setup.sh 3 test
Not equal to 5
shumail@shumail1:~$ _
```

Q5_numeric_tests

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

str=$2

if [ $num -eq 5 ]; then
    echo "Equal to 5"
else
    echo "Not equal to 5"
fi
if [ $num -ne 5 ]; then echo "Not equal to 5"; fi
if [ $num -gt 5 ]; then echo "Greater than 5"; fi
if [ $num -lt 5 ]; then echo "Less than 5"; fi
if [ $num -ge 5 ]; then echo "Greater or equal to 5"; fi
if [ $num -le 5 ]; then echo "Less or equal to 5"; fi

~
~
~
~
~
~
~
~
~
~
```

```
~
~
~
"setup.sh" 27L, 420B written
shumail@shumail1:~$ ./setup.sh 4 test
Not equal to 5
4 is not equal to 5
4 is less than 5
4 is less or equal to 5
shumail@shumail1:~$ ./setup.sh 6 test
Not equal to 5
6 is not equal to 5
6 is greater than 5
6 is greater or equal to 5
shumail@shumail1:~$
shumail@shumail1:~$
shumail@shumail1:~$ _
```

Q5 string tests

```
fi
if [ $num -ne 5 ]; then echo "$num is not equal to 5"; fi

if [ $num -gt 5 ]; then echo "$num is greater than 5"; fi

if [ $num -lt 5 ]; then echo "$num is less than 5"; fi

if [ $num -ge 5 ]; then echo "$num is greater or equal to 5"; fi

if [ $num -le 5 ]; then echo "$num is less or equal to 5"; fi

if [ "$str" = "hello" ]; then
    echo "String equals hello"
else
    echo "String not equal to hello"
fi

if [ -z "$str" ]; then
    echo "String is empty"
else
    echo "String is not empty"
fi

~
~
~
~
```

```
~
~
~
"setup.sh" 48L, 646B written
shumail@shumail1:~$ ./setup.sh 5 hello
Equal to 5
5 is greater or equal to 5
5 is less or equal to 5
String equals hello
String is not empty
shumail@shumail1:~$ ./setup.sh 6 hi
Not equal to 5
6 is not equal to 5
6 is greater than 5
6 is greater or equal to 5
String not equal to hello
String is not empty
shumail@shumail1:~$ ./setup.sh 6 ""
Not equal to 5
6 is not equal to 5
6 is greater than 5
6 is greater or equal to 5
String not equal to hello
String is empty
shumail@shumail1:~$
```

6. Script: For Loop and Argument Handling

Q6_script_forloop_vim

```
#!/bin/bash
for arg in "$@"
do
    echo "$arg"
done
~
~
~
~
```

Q6_forloop_run

```
try: sudo apt install <deb name>
shumail@shumail1:~$ ./setup.sh apple banana "green grapes" "mango juice" cherry
apple
banana
green grapes
mango juice
cherry
shumail@shumail1:~$
```

7. Script: While Loop Summation and Functions

Q7_while_session

Q7_function_sum

~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~

```
"setup.sh" 27L, 271B written
shumail@shumail1:~$ chmod +x setup.sh
shumail@shumail1:~$ ./setup.sh
Enter a number (q to quit): 5
Running total: 5
Enter a number (q to quit): 3
Running total: 8
Enter a number (q to quit): q
Final total: 8
shumail@shumail1:~$
shumail@shumail1:~$
```

```
while true
do
    read -p "Enter a number (q to quit): " num
    if [ "$num" = "q" ]; then
        break
    fi
    sum=$((sum + num))
    echo "Running total: $sum"
done

echo "Final total: $sum"

sum=0
sum_two() {
    local result=$(( $1 + $2 ))
    echo $result
}

total=$((sum_two 7 9))
echo "Sum from function = $total"

~
~
~
~
~
~
```

```

while true
do
    read -p "Enter a number (q to quit): " num
    if [ "$num" = "q" ]; then
        break
    fi
    sum=$((sum + num))
    echo "Running total: $sum"
done

echo "Final total: $sum"

sum=0

while true
do
    read -p "Enter a number (q to quit): " num
    if [ "$num" = "q" ]; then
        break
    fi
    sum=$((sum + num))
    echo "Running total: $sum"
done

echo "Final total: $sum"

```

```

echo "Sum from function = $total"

```

```

~
~
~
~
~
~
~
~
~
~
~

```

```

"setup.sh" 42L, 412B written
shumail@shumail1:~$ ./setup.sh
Enter a number (q to quit): 3
Running total: 3
Enter a number (q to quit): 2
Running total: 5
Enter a number (q to quit): q
Final total: 5
Sum from function = 16
shumail@shumail1:~$ _

```