LAB # 06:

CLOUD COMPUTING:

FROM:

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2023-BSE-005

SECTION A

BSE 5

TO:

SIR SHOAIB

TITLE:

LINUX USERS, GROUPS, PERMISSIONS, PIPES, AND BASH SCRIPTING

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

```
alina005@ubuntu:~$ sudo passwd root
[sudo] password for alina005:
New password:
Retype new password:
passwd: password updated successfully
alina005@ubuntu:~$
```

```
alina005@ubuntu:~$ su -
Password:
root@ubuntu:~# whoami
root
root@ubuntu:~# id
uid=0(root) gid=0(root) groups=0(root)
root@ubuntu:~#
```

```
root@ubuntu:~# exit
logout
alina005@ubuntu:~$ whoami
alina005
alina005@ubuntu:~$
```

Task 2 – Create user tom and verify in passwd/group/shadow
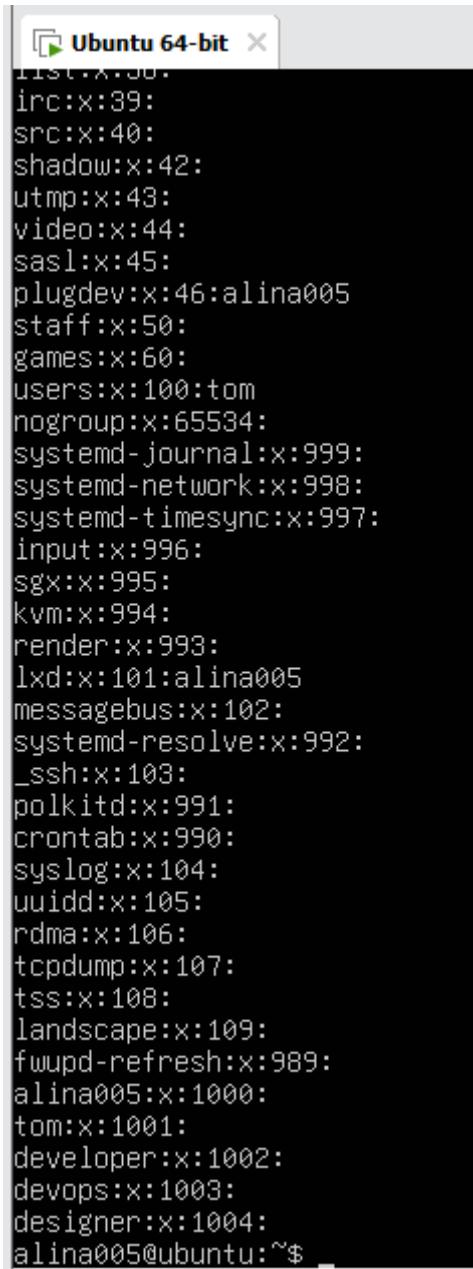
```
alina005@ubuntu:~$ sudo adduser tom
info: Adding user `tom' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group `tom' (1001) ...
info: Adding new user `tom' (1001) with group `tom (1001)' ...
info: Creating home directory `/home/tom' ...
info: Copying files from `/etc/skel' ...
New password:
Retype new password:
Sorry, passwords do not match.
passwd: Authentication token manipulation error
passwd: password unchanged
Try again? [y/N] y
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' ...
alina005@ubuntu:~$
```

```
alina005@ubuntu:~$ 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
alina005:x:1000:1000:alina005:/home/alina005:/bin/bash
sshd:x:109:65534::/run/sshd:/usr/sbin/nologin
tom:x:1001:1001:,,,:/home/tom:/bin/bash
alina005@ubuntu:~$
```

```
www-data:x:33:
backup:x:34:
operator:x:37:
list:x:38:
irc:x:39:
src:x:40:
shadow:x:42:
utmp:x:43:
video:x:44:
sasl:x:45:
plugdev:x:46:alina005
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:alina005
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:
alina005:x:1000:
tom:x:1001:
alina005@ubuntu:~$
```

```
alina005@ubuntu:~$ sudo cat /etc/shadow
root:$y$j9T$TdYUPhIig62/gvTmfprOD.$caWd3tATCK8mJb6LhFfQs4eCk.tgXjcb1ChXD4Qbsy2:20399:0:99999:7:::
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-network:!*:20305:::::::
systemd-timesync:!*:20305::::::
dhcpcd:!:20305:::::
messagebus:!:20305::::::
systemd-resolve:!*:20305::::::
pollinate:!:20305::::::
polkitd:!*:20305::::::
syslog:!:20305::::::
uuidd:!:20305::::::
tcpdump:!:20305::::::
tss:!:20305::::::
landscape:!:20305::::::
fwupd-refresh:!*:20305::::::
usbmux:!:20385::::::
alina005:$6$hRPG27XIbhIbSAjr$X1m7Zrr9Qu68HawPEfCqKoB2tIxMY29kySLWT80NZUhcyBjokhTMeIZ77J6GJtvUIXIHzb/4UOOl6YTJDGobE1:20385:0:99999:7:::
sshd:!:20385::::::
tom:$y$j9T$Grovr/HAzGewYCJnEQki7.$LRmlMHcCb12OHxCtb7UHN5m0fDGJ8r3/EtKTwTmLGy3:20399:0:99999:7:::
alina005@ubuntu:~$
```

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

```
Ubuntu 64-bit  X
list:x:3θ:
irc:x:39:
src:x:40:
shadow:x:42:
utmp:x:43:
video:x:44:
sasl:x:45:
plugdev:x:46:alina005
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:alina005
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:
alina005:x:1000:
tom:x:1001:
developer:x:1002:
devops:x:1003:
designer:x:1004:
alina005@ubuntu:~$
```

```
alina005@ubuntu:~$ sudo usermod -g designer tom
alina005@ubuntu:~$ id tom
uid=1001(tom) gid=1004(designer) groups=1004(designer),100(users)
alina005@ubuntu:~$
```

```
alina005@ubuntu:~$ sudo usermod -aG developer,devops tom
alina005@ubuntu:~$ id tom
uid=1001(tom) gid=1004(designer) groups=1004(designer),100(users),1002(developer),1003(devops)
alina005@ubuntu:~$ groups tom
tom : designer users developer devops
alina005@ubuntu:~$
```

```
alina005@ubuntu:~$ sudo usermod -aG developer,devops tom
alina005@ubuntu:~$ id tom
uid=1001(tom) gid=1004(designer) groups=1004(designer),100(users),1002(developer),1003(devops)
alina005@ubuntu:~$ groups tom
tom : designer users developer devops
alina005@ubuntu:~$ sudo usermod -G tom tom
alina005@ubuntu:~$ id tom
uid=1001(tom) gid=1004(designer) groups=1004(designer),1001(tom)
alina005@ubuntu:~$ groups tom
tom : designer tom
alina005@ubuntu:~$
```

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

```
alina005@ubuntu:~$ 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] Y
info: Adding new user `jerry' to supplemental / extra groups `users' ...
info: Adding user `jerry' to group `users' ...
alina005@ubuntu:~$ sudo useradd scooby
alina005@ubuntu:~$
```

```
alina005@ubuntu:~$ su -scooby
Password:
su: Authentication failure
alina005@ubuntu:~$
```

```
alina005@ubuntu:~$ sudo passwd scooby
New password:
Retype new password:
passwd: password updated successfully
alina005@ubuntu:~$
```

```
alina005@ubuntu:~$ sudo passwd scooby
New password:
Retype new password:
passwd: password updated successfully
alina005@ubuntu:~$ su - scooby
Password:
su: warning: cannot change directory to /home/scooby: No such file or directory
$
```

```
sys: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
alina005:x:1000:1000:alina005:/home/alina005:/bin/bash
sshd:x:109:65534::/run/sshd:/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
alina005@ubuntu:~$ ls -id /home/scooby
ls: cannot access '/home/scooby': No such file or directory
alina005@ubuntu:~$
```

```
alina005@ubuntu:~$ sudo mkdir -p /home/scooby
alina005@ubuntu:~$ sudo chown scooby:scooby /home/scooby
alina005@ubuntu:~$ sudo chmod 750 /home/scooby
alina005@ubuntu:~$ ls -ld /home/scooby
drwxr-x--- 2 scooby scooby 4096 Nov  7 04:50 /home/scooby
alina005@ubuntu:~$
```

```
alina005@ubuntu:~$ su - scooby
Password:
$ exit
alina005@ubuntu:~$ pwd
/home/alina005
alina005@ubuntu:~$ ls
answers.md   apt_update_vs_upgrade.md   Lab   Lab4
alina005@ubuntu:~$
```

```
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
alina005:x:1000:1000:alina005:/home/alina005:/bin/bash
sshd:x:109:65534::/run/sshd:/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
alina005@ubuntu:~$
```

```
alina005@ubuntu:~$ sudo usermod -s /bin/bash scooby
alina005@ubuntu:~$ su - scooby
Password:
scooby@ubuntu:~$
```

```
alina005@ubuntu:~$ sudo addgroup jolly
info: Selecting GID from range 1000 to 59999 ...
info: Adding group `jolly' (GID 1007) ...
alina005@ubuntu:~$ sudo groupadd anime
alina005@ubuntu:~$
```

```
utmp:x:43:
video:x:44:
sasl:x:45:
plugdev:x:46:alina005
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:alina005
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:
alina005:x:1000:
tom:x:1001:tom
developer:x:1002:
devops:x:1003:
designer:x:1004:
jerry:x:1005:
scooby:x:1006:
jolly:x:1007:
anime:x:1008:
alina005@ubuntu:~$
```

```
src.x.40.
shadow:x:42:
utmp:x:43:
video:x:44:
sasl:x:45:
plugdev:x:46:alina005
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:alina005
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:
alina005:x:1000:
tom:x:1001:tom
developer:x:1002:
devops:x:1003:
designer:x:1004:
jerry:x:1005:
scooby:x:1006:
alina005@ubuntu:~$
```

```
userdel: scooby mail spool (/var/mail/scooby) not found
alina005@ubuntu:~$ 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
alina005:x:1000:1000:alina005:/home/alina005:/bin/bash
sshd:x:109:65534::/run/sshd:/usr/sbin/nologin
tom:x:1001:1004:,,,:/home/tom:/bin/bash
alina005@ubuntu:~$ _
```

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

```
alina005@ubuntu:~$ 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] Y
info: Adding new user `student' to supplemental / extra groups `users' ...
info: Adding user `student' to group `users' ...
alina005@ubuntu:~$
```

```
alina005@ubuntu:~$ su - student
Password:
student@ubuntu:~$ touch file1
student@ubuntu:~$ mkdir -p dir1
student@ubuntu:~$ touch dir1/file2
student@ubuntu:~$ ls -l
total 4
drwxrwxr-x 2 student student 4096 Nov  7 05:24 dir1
-rw-rw-r-- 1 student student    0 Nov  7 05:24 file1
student@ubuntu:~$
```

```
student@ubuntu:~$ sudo chown tom file1
[sudo] password for student:
student is not in the sudoers file.
student@ubuntu:~$ ls -l file1
-rw-rw-r-- 1 student student 0 Nov  7 05:24 file1
student@ubuntu:~$
```

```
student@ubuntu:~$ sudo chgrp devops file1
[sudo] password for student:
student is not in the sudoers file.
student@ubuntu:~$ ls -l file1
-rw-rw-r-- 1 student student 0 Nov  7 05:24 file1
student@ubuntu:~$
```

```
student@ubuntu:~$ ls -l
total 4
drwxrwxr-x 2 student student 4096 Nov  7 05:24 dir1
-rw-rw-r-- 1 student student    0 Nov  7 05:24 file1
student@ubuntu:~$ sudo chown tom file1
[sudo] password for student:
student is not in the sudoers file.
student@ubuntu:~$ ls -l file1
-rw-rw-r-- 1 student student 0 Nov  7 05:24 file1
student@ubuntu:~$ sudo chgrp devops file1
[sudo] password for student:
student is not in the sudoers file.
student@ubuntu:~$ ls -l file1
-rw-rw-r-- 1 student student 0 Nov  7 05:24 file1
student@ubuntu:~$ ls -l
total 4
drwxrwxr-x 2 student student 4096 Nov  7 05:24 dir1
-rw-rw-r-- 1 student student    0 Nov  7 05:24 file1
student@ubuntu:~$ ls -l dir1
total 0
-rw-rw-r-- 1 student student 0 Nov  7 05:24 file2
student@ubuntu:~$ ls -l /dev/null
crw-rw-rw- 1 root root 1, 3 Nov  7 03:58 /dev/null
student@ubuntu:~$ file file1 dir1 /dev/null
file1:     empty
dir1:      directory
/dev/null: character special (1/3)
student@ubuntu:~$
```

```
Ubuntu 24.04.3 LTS ubuntu tty1

ubuntu login: alina005
Password:
Welcome to Ubuntu 24.04.3 LTS (GNU/Linux 6.8.0-87-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/pro

 System information as of Fri  7 Nov 05:44:50 UTC 2025

  System load:  0.1                 Processes:              231
  Usage of /:   30.2% of 18.53GB    Users logged in:        0
  Memory usage: 14%                 IPv4 address for ens33: 192.168.170.131
  Swap usage:   0%


Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status


alina005@ubuntu:~$
```

Task 6 – Change permissions using symbolic mode

```
alina005@ubuntu:~$ su - student
Password:
student@ubuntu:~$ cd ~
student@ubuntu:~$ ls -l file1
-rw-rw-r-- 1 student student 0 Nov  7 05:24 file1
student@ubuntu:~$ _
```

```
student@ubuntu:~$ chmod -rwx file1
student@ubuntu:~$ ls -l file1
---------- 1 student student 0 Nov  7 05:24 file1
student@ubuntu:~$ _
```

```
                       1 student student 0 Nov   7 05:24 file1
student@ubuntu:~$ chmod +r file1
student@ubuntu:~$ ls -l file1
-r--r--r-- 1 student student 0 Nov   7 05:24 file1
student@ubuntu:~$ _
```

```
student@ubuntu:~$ chmod u+x file1
student@ubuntu:~$ ls -l file1
-r-xr--r-- 1 student student 0 Nov   7 05:24 file1
student@ubuntu:~$
```

```
student@ubuntu:~$ chmod ug+w file1
student@ubuntu:~$ ls -l file1
-rwxrw-r-- 1 student student 0 Nov   7 05:24 file1
student@ubuntu:~$ _
```

```
student@ubuntu:~$ chmod ugo-rwx file1
student@ubuntu:~$ ls -l file1
---------- 1 student student 0 Nov   7 05:24 file1
student@ubuntu:~$
```

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

```
student@ubuntu:~$ su - student
Password:
student@ubuntu:~$ cd ~
student@ubuntu:~$ ls -l file1
---------- 1 student student 0 Nov   7 05:24 file1
student@ubuntu:~$
```

```
student@ubuntu:~$ chmod u=rwx,g=rwx,o=rwx file1
student@ubuntu:~$ ls -l file1
-rwxrwxrwx 1 student student 0 Nov   7 05:24 file1
student@ubuntu:~$ _
```

```
-rwxrwxrwx 1 student student 0 Nov   7 05:24 file1
student@ubuntu:~$ chmod g=rw,o=rw file1
student@ubuntu:~$ ls -l file1
-rwxrw-rw- 1 student student 0 Nov   7 05:24 file1
student@ubuntu:~$ _
```

```
student@ubuntu:~$ chmod u=,g=,o= file1
student@ubuntu:~$ ls -l file1
---------- 1 student student 0 Nov   7 05:24 file1
student@ubuntu:~$
```

Task 8 – Change permissions using numeric (octal) mode

```
student@ubuntu:~$ su - student
Password:
student@ubuntu:~$ cd ~
student@ubuntu:~$ ls -l file1
---------- 1 student student 0 Nov  7 05:24 file1
student@ubuntu:~$
```

```
student@ubuntu:~$ chmod 777 file1
student@ubuntu:~$ ls -l file1
-rwxrwxrwx 1 student student 0 Nov  7 05:24 file1
student@ubuntu:~$
```

```
student@ubuntu:~$ chmod 700 file1
student@ubuntu:~$ ls -l file1
-rwx------ 1 student student 0 Nov  7 05:24 file1
student@ubuntu:~$
```

```
student@ubuntu:~$ chmod 744 file1
student@ubuntu:~$ ls -l file1
-rwxr--r-- 1 student student 0 Nov  7 05:24 file1
student@ubuntu:~$
```

```
student@ubuntu:~$ chmod 740 file1
student@ubuntu:~$ ls -l file1
-rwxr----- 1 student student 0 Nov  7 05:24 file1
```

```
student@ubuntu:~$ chmod 664 file1
student@ubuntu:~$ ls -l file1
-rw-rw-r-- 1 student student 0 Nov  7 05:24 file1
student@ubuntu:~$ chmod 775 file1
student@ubuntu:~$ ls -l file1
-rwxrwxr-x 1 student student 0 Nov  7 05:24 file1
student@ubuntu:~$ chmod 750 file1
student@ubuntu:~$ ls -l file1
-rwxr-x--- 1 student student 0 Nov  7 05:24 file1
student@ubuntu:~$
```

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

```
e of an unmet condition check (ConditionPathExists=/run/plymouth/pid).
2025-11-21T17:15:40.663065+00:00 ubuntu systemd[1]: Reached target cryptsetup.target - Local Encrypted Volumes.
2025-11-21T17:15:40.663105+00:00 ubuntu multipath: sda: failed to get sysfs uid: No such file or directory
2025-11-21T17:15:40.663148+00:00 ubuntu multipath: sda: failed to get sgio uid: No such file or directory
2025-11-21T17:15:40.663231+00:00 ubuntu multipathd[488]: sda: failed to get udev uid: No data available
2025-11-21T17:15:40.665638+00:00 ubuntu multipathd[488]: sda: failed to get path uid
2025-11-21T17:15:40.665687+00:00 ubuntu multipathd[488]: uevent trigger error
2025-11-21T17:15:40.665722+00:00 ubuntu systemd[1]: Found device dev-disk-by\x2duuid-5d7791e3\x2d4ca8\x2d4aa7\x2d82ec\x2d9227921d8b12.device - Y
2025-11-21T17:15:40.665834+00:00 ubuntu systemd[1]: Starting systemd-fsck@dev-disk-by\x2duuid-5d7791e3\x2d4ca8\x2d4aa7\x2d82ec\x2d9227921d8b12.s
stem Check on /dev/disk/by-uuid/5d7791e3-4ca8-4aa7-82ec-9227921d8b12...
2025-11-21T17:15:40.665873+00:00 ubuntu systemd[1]: Started systemd-fsckd.service - File System Check Daemon to report status.
2025-11-21T17:15:40.665942+00:00 ubuntu systemd-fsck[603]: /dev/sda2: recovering journal
2025-11-21T17:15:40.665979+00:00 ubuntu systemd-fsck[603]: /dev/sda2: clean, 321/131072 files, 76331/524288 blocks
2025-11-21T17:15:40.666022+00:00 ubuntu systemd[1]: Finished systemd-fsck@dev-disk-by\x2duuid-5d7791e3\x2d4ca8\x2d4aa7\x2d82ec\x2d9227921d8b12.s
stem Check on /dev/disk/by-uuid/5d7791e3-4ca8-4aa7-82ec-9227921d8b12.
2025-11-21T17:15:40.666067+00:00 ubuntu systemd[1]: Mounting boot.mount - /boot...
2025-11-21T17:15:40.666100+00:00 ubuntu lvm[598]: PV /dev/sda3 online, VG ubuntu-vg is complete.
2025-11-21T17:15:40.666136+00:00 ubuntu lvm[598]: VG ubuntu-vg finished
2025-11-21T17:15:40.666200+00:00 ubuntu systemd[1]: Mounted boot.mount - /boot.
2025-11-21T17:15:40.667357+00:00 ubuntu systemd[1]: Reached target local-fs.target - Local File Systems.
2025-11-21T17:15:40.667430+00:00 ubuntu systemd[1]: Listening on systemd-sysext.socket - System Extension Image Management (Varlink).
2025-11-21T17:15:40.667488+00:00 ubuntu systemd[1]: Starting apparmor.service - Load AppArmor profiles...
2025-11-21T17:15:40.667546+00:00 ubuntu systemd[1]: Starting console-setup.service - Set console font and keymap...
2025-11-21T17:15:40.667599+00:00 ubuntu systemd[1]: Starting finalrd.service - Create final runtime dir for shutdown pivot root...
2025-11-21T17:15:40.667670+00:00 ubuntu systemd[1]: ldconfig.service - Rebuild Dynamic Linker Cache was skipped because no trigger condition che
2025-11-21T17:15:40.667709+00:00 ubuntu systemd[1]: Starting plymouth-read-write.service - Tell Plymouth To Write Out Runtime Data...
2025-11-21T17:15:40.667826+00:00 ubuntu apparmor.systemd[610]: Restarting AppArmor
2025-11-21T17:15:40.667873+00:00 ubuntu systemd[1]: Starting systemd-binfmt.service - Set Up Additional Binary Formats...
2025-11-21T17:15:40.667909+00:00 ubuntu apparmor.systemd[610]: /lib/apparmor/apparmor.systemd: 148: [: Illegal number: yes
2025-11-21T17:15:40.667975+00:00 ubuntu apparmor.systemd[610]: Reloading AppArmor profiles
2025-11-21T17:15:40.668020+00:00 ubuntu systemd[1]: Starting systemd-tmpfiles-setup.service - Create Volatile Files and Directories...
alina005@ubuntu:~$
```

```
alina005@ubuntu:~$ sudo grep -E var/log/syslog >~/temp_errors.txt
[sudo] password for alina005:
^C
alina005@ubuntu:~$ head ~/temp_errors.txt
alina005@ubuntu:~$
```

```
alina005@ubuntu:~$ sudo grep -i systemd /var/log/syslog > ~/syslog_systemd.txt
[sudo] password for alina005:
alina005@ubuntu:~$
```

```
alina005@ubuntu:~$ cat ~/syslog-systemd.txt
```
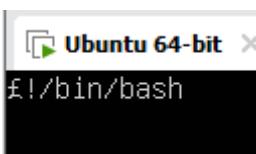
```
Oct 24 08:50:53 ubuntu kernel: BIOS-e820: [mem 0x00000000000dc000-0x00000000000fffff] reserved
Oct 24 08:50:53 ubuntu kernel: BIOS-e820: [mem 0x0000000000100000-0x000000007fedffff] usable
Oct 24 08:50:53 ubuntu kernel: BIOS-e820: [mem 0x000000007fee0000-0x000000007fefefff] ACPI data
Oct 24 08:50:53 ubuntu kernel: BIOS-e820: [mem 0x000000007feff000-0x000000007fefffff] ACPI NVS
Oct 24 08:50:53 ubuntu kernel: BIOS-e820: [mem 0x000000007ff00000-0x000000007fffffff] usable
Oct 24 08:50:53 ubuntu kernel: BIOS-e820: [mem 0x00000000f0000000-0x00000000f7ffffff] reserved
Oct 24 08:50:53 ubuntu kernel: BIOS-e820: [mem 0x00000000fec00000-0x00000000fec0ffff] reserved
Oct 24 08:50:53 ubuntu kernel: BIOS-e820: [mem 0x00000000fee00000-0x00000000fee00fff] reserved
Oct 24 08:50:53 ubuntu kernel: BIOS-e820: [mem 0x00000000fffe0000-0x00000000ffffffff] reserved
Oct 24 08:50:53 ubuntu kernel: NX (Execute Disable) protection: active
Oct 24 08:50:53 ubuntu kernel: APIC: Static calls initialized
Oct 24 08:50:53 ubuntu kernel: SMBIOS 2.7 present.
Oct 24 08:50:53 ubuntu kernel: DMI: VMware, Inc. VMware Virtual Platform/440BX Desktop Reference Platform, BIOS 6.00 11/12/2020
Oct 24 08:50:53 ubuntu kernel: vmware: hypercall mode: 0x02
Oct 24 08:50:53 ubuntu kernel: Hypervisor detected: VMware
Oct 24 08:50:53 ubuntu kernel: vmware: TSC freq read from hypervisor : 2294.690 MHz
Oct 24 08:50:53 ubuntu kernel: vmware: Host bus clock speed read from hypervisor : 66000000 Hz
Oct 24 08:50:53 ubuntu kernel: vmware: using clock offset of 12320841267 ns
Oct 24 08:50:53 ubuntu kernel: tsc: Detected 2294.690 MHz processor
Oct 24 08:50:53 ubuntu kernel: e820: update [mem 0x00000000-0x00000fff] usable ==> reserved
Oct 24 08:50:53 ubuntu kernel: e820: remove [mem 0x000a0000-0x000fffff] usable
Oct 24 08:50:53 ubuntu kernel: last_pfn = 0x80000 max_arch_pfn = 0x400000000
Oct 24 08:50:53 ubuntu kernel: total RAM covered: 3072M
Oct 24 08:50:53 ubuntu kernel: Found optimal setting for mtrr clean up
Oct 24 08:50:53 ubuntu kernel:  gran_size: 64K        chunk_size: 64K        num_reg: 2        lose cover RAM: 0G
Oct 24 08:50:53 ubuntu kernel: MTRR map: 6 entries (5 fixed + 1 variable; max 21), built from 8 variable MTRRs
Oct 24 08:50:53 ubuntu kernel: x86/PAT: Configuration [0-7]: WB  WC  UC- UC  WB  WP  UC- WT
Oct 24 08:50:53 ubuntu kernel: found SMP MP-table at [mem 0x000f6a70-0x000f6a7f]
Oct 24 08:50:53 ubuntu kernel: Using GB pages for direct mapping
Oct 24 08:50:53 ubuntu kernel: RAMDISK: [mem 0x2f5b5000-0x33ad1fff]
Oct 24 08:50:53 ubuntu kernel: ACPI: Early table checksum verification disabled
Oct 24 08:50:53 ubuntu kernel: ACPI: RSDP 0x00000000000F6A00 000024 (v02 PTLTD )
Oct 24 08:50:53 ubuntu kernel: ACPI: XSDT 0x000000007FEE965B 00005C (v01 INTEL  440BX    06040000 VMW  01324272)
Oct 24 08:50:53 ubuntu kernel: ACPI: FACP 0x000000007FEFEE73 0000F4 (v04 INTEL  440BX    06040000 PTL  000F4240)
Oct 24 08:50:53 ubuntu kernel: ACPI: DSDT 0x000000007FEEAD55 01411E (v01 PTLTD  Custom   06040000 MSFT 03000001)
Oct 24 08:50:53 ubuntu kernel: ACPI: FACS 0x000000007FEFFFC0 000040
/home/alina005/journal_full.txt
```

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


```
£!/bin/bash
```



```
"setup.sh" [New] 3L, 15B written
student@ubuntu:~$ chmod +x setup.sh
```

```
🖵 Ubuntu 64-bit ✕
£!/bin/bash

i
£ define and show var 1
var 1="hello from Lab 06"
echo "var1 : $var2"_

~
~
~
~
~
```

```
student@ubuntu:~$ cat -n setup.sh
     1  £!/bin/bash
     2
     3  i
     4  £ define and show var 1
     5  var 1="hello from Lab 06"
     6  echo "var1 : $var2"
     7
student@ubuntu:~$
```

```
£save ls -l to variable and display
all files= "$(la -l)"
echo "allfiles(la -l)"
echo "$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


~
```

```bash
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
```

```bash
            echo "file2 created."
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"


~
```

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

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

```bash
#!/bin/bash
num=$1
str=$2
if [ "$num" -eq 10 ]; then

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

else

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

fi
```

```bash
#!/bin/bash
num=$1
str=$2
if [ "$num" -eq 10 ]; then

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

else

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

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

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

fi
```

```
fi
if [ "$num" -ne 10 ]; then
        echo "$num is not equal 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
```

```
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 (-lt0."

else

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

fi
_
```

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

        echo"$num is less than 10 (-lt0."

else

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

fi

if [ "$num2" -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
```

```
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 i NOT less than or equal to 10 (-le)."

fi
```

```
if [ "$num" -le 10 ]; then

        echo "$num is less than or equal to 10 (-le)."

else

        echo "$num i 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
```

```
fi

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

        echo "Second argument equals 'Student' ( = )."

else

        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
```

```bash
fi

if [ -z "$str" ]; then

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

else

        echo "Second argument is not empty."

fi
```

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

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

```bash
#!/bin/bash
# Script to demonstrate printing all user-entered arguments using $*
#  Print all arguments using $*
echo "Printing all arguments using /$*:"
for arg in $*; do
        echo "Argument: $arg"
done
-- INSERT --
```

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

```bash
#!/bin/bash
# While-loop sumnation (interactive)
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 "Final total: $sum"
```

```
            fi
            sum=$((sum + input))
            echo "Total Score: $sum"
    done
    echo "Final total: $sum"




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

```
}
#Demonstrate the function
echo "Now calling sum_two function:"
sum_two# Function that sms 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"
-- INSERT --
```
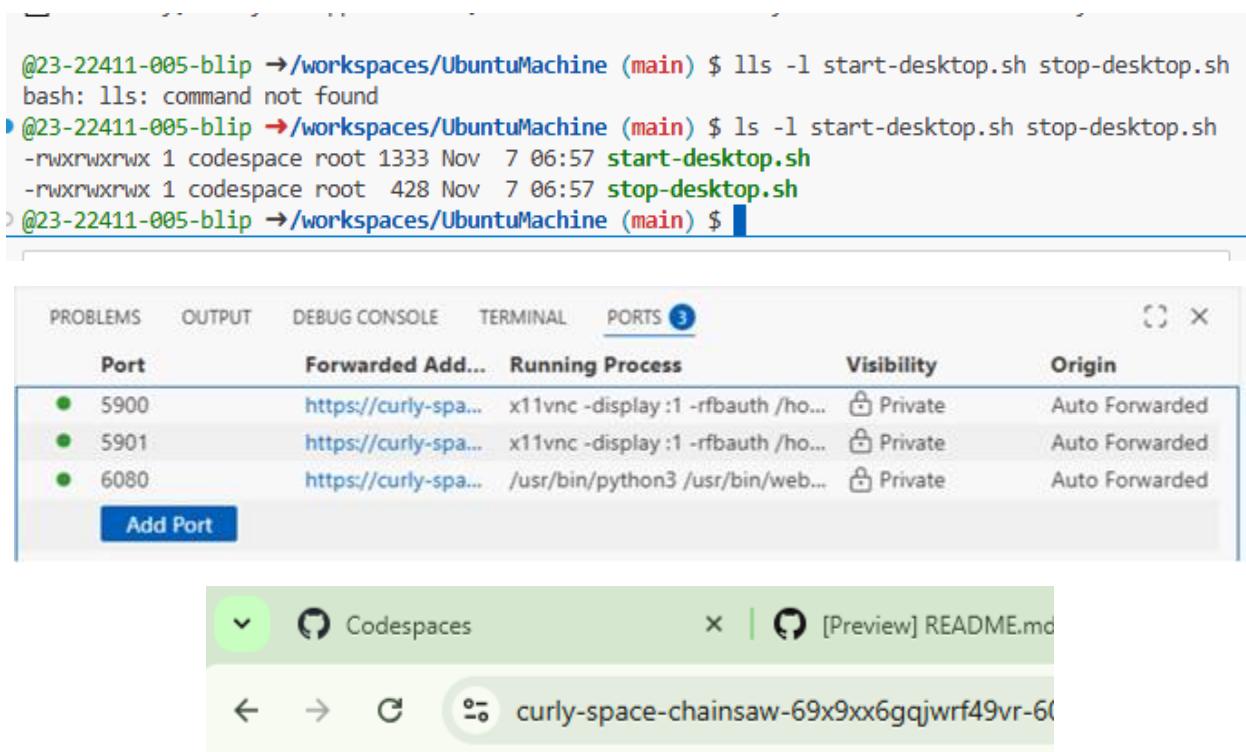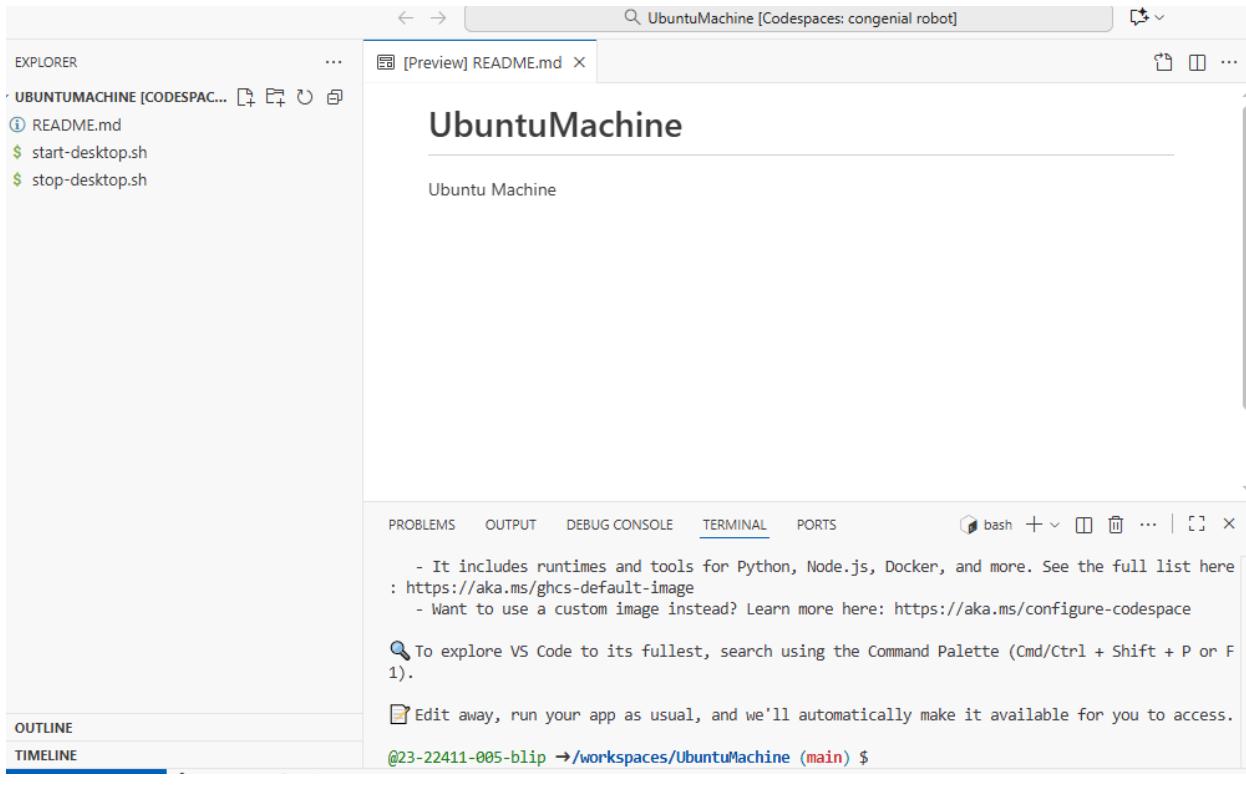
Task 14 – Codespaces GUI — fork repo, run start-desktop.sh, open VNC, stop GUI

EXPLORER ...
UBUNTUMACHINE [CODESPAC...
ⓘ README.md
$ start-desktop.sh
$ stop-desktop.sh

[Preview] README.md ✕

UbuntuMachine

Ubuntu Machine

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
    - It includes runtimes and tools for Python, Node.js, Docker, and more. See the full list here
: https://aka.ms/ghcs-default-image
    - Want to use a custom image instead? Learn more here: https://aka.ms/configure-codespace

🔍 To explore VS Code to its fullest, search using the Command Palette (Cmd/Ctrl + Shift + P or F
1).

📝 Edit away, run your app as usual, and we'll automatically make it available for you to access.

@23-22411-005-blip →/workspaces/UbuntuMachine (main) $
```

OUTLINE
TIMELINE

```
@23-22411-005-blip →/workspaces/UbuntuMachine (main) $ lls -l start-desktop.sh stop-desktop.sh
bash: lls: command not found
@23-22411-005-blip →/workspaces/UbuntuMachine (main) $ ls -l start-desktop.sh stop-desktop.sh
-rwxrwxrwx 1 codespace root 1333 Nov  7 06:57 start-desktop.sh
-rwxrwxrwx 1 codespace root  428 Nov  7 06:57 stop-desktop.sh
@23-22411-005-blip →/workspaces/UbuntuMachine (main) $
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS ③

Port	Forwarded Add...	Running Process	Visibility	Origin
● 5900	https://curly-spa...	x11vnc -display :1 -rfbauth /ho...	🔒 Private	Auto Forwarded
● 5901	https://curly-spa...	x11vnc -display :1 -rfbauth /ho...	🔒 Private	Auto Forwarded
● 6080	https://curly-spa...	/usr/bin/python3 /usr/bin/web...	🔒 Private	Auto Forwarded

Add Port

○ Codespaces ✕ | ○ [Preview] README.md

← → C curly-space-chainsaw-69x9xx6gqjwrf49vr-6(

Directory listing for /

- app/
- core/
- include/
- utils/
- vendor/
- vnc.html
- vnc_auto.html@
- vnc_lite.html