

CLOUD COMPUTING LAB

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LAB #06

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

- **task1_set_root_password.png**

```
maria06@maria076:~$ su -
Password:
root@maria076:~# whoami
root
root@maria076:~# id
uid=0(root) gid=0(root) groups=0(root)
```

- **task1_su_root.png**

```
root@maria076:~# exit
logout
mariamaria06@maria076:~$ whoami
mariamaria06
```

- **task1_exit_to_user.png**

```
mariamaria06@maria076:~$ whoami
mariamaria06
mariamaria06@maria076:~$ 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 []: maria abdul malik
      Room Number []: 12
      Work Phone []: 03490014290
      Home Phone []: 03490014290
      Other []: 0000000000
Is the information correct? [Y/n] y
info: Adding new user `tom' to supplemental / extra groups `users' ...
info: Adding user `tom' to group `users' ...
```

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

- task2_adduser_tom.png

```
maria06:x:1000:1000:maria abdul malik:/home/maria06:/bin/bash
sshd:x:109:65534::/run/sshd:/usr/sbin/nologin
tom:x:1001:1001:maria abdul malik,12,03490014290,03490014290,000000000000:/home/tom:/bin/bash
```

- task2_verify_passwd.png

```
lxd:x:101:maria06
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:
maria06:x:1000:
tom:x:1001:
```

- task2_verify_group.png

```
polkitd:!*:20305::::::
syslog:!*:20305::::::
uuidd:!*:20305::::::
tcpdump:!*:20305::::::
tss:!*:20305::::::
landscape:!*:20305::::::
fwupd-refresh:!*:20305::::::
usbmux:!*:20372::::::
maria06:$6$kL/jtp2RB40hmZGg$w5EkXxfTBP2Pdm
sshd:!*:20378::::::
tom:$u$i9T$rcr75h9Gi/reRdAu0gN0AA$ u +PMu/
```

- task2_verify_shadow.png

```
lxd:x:101:maria06
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:
maria06:x:1000:
tom:x:1001:
developer:x:1002:
devops:x:1003:
designer:x:1004:
```

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

- task3_groupadd.png

```
safamod: group desigher does not exist  
safa@safa056:~$ sudo usermod -g desigher tom  
safa@safa056:~$ id tom  
uid=1001(tom) gid=1004(desigher) groups=1004(desigher),100(users)  
safa@safa056:~$
```

- task3_change_primary_group.png

```
usermod: group desigher does not exist  
safa@safa056:~$ sudo usermod -g desigher tom  
safa@safa056:~$ id tom  
uid=1001(tom) gid=1001(desigher) groups=1004(desigher),100(users)  
safa@safa056:~$
```

- task3_add_secondary_groups.png

```
maria06@maria076:~$ sudo usermod -aG developer,devops tom  
maria06@maria076:~$ id tom  
uid=1001(tom) gid=1001(tom) groups=1001(tom),100(users),1002(developer),1003(devops)  
maria06@maria076:~$ groups tom  
tom : tom users developer devops
```

- task3_reset_secondary_groups.png

```
maria06@maria076:~$ sudo usermod -G tom tom  
maria06@maria076:~$ id tom  
uid=1001(tom) gid=1001(tom) groups=1001(tom)  
maria06@maria076:~$ groups tom  
tom : tom
```

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

- task4_add_users.png

```
maria06@maria076:~$ sudo adduser scooby
info: Adding user `scooby' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group `scooby' (1007) ...
info: Adding new user `scooby' (1007) with group `scooby (1007)' ...
info: Creating home directory `/home/scooby' ...
info: Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for scooby
Enter the new value, or press ENTER for the default
    Full Name []: maria abdul malik
    Room Number []: 00
    Work Phone []: 0000000000000000
    Home Phone []: 0000000000000000
    Other []: 00000000000000
Is the information correct? [Y/n] y
info: Adding new user `scooby' to supplemental / extra groups `users' ...
info: Adding user `scooby' to group `users' ...
```

```
maria06@maria076:~$ sudo adduser jerry
info: Adding user `jerry' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group `jerry' (1008) ...
info: Adding new user `jerry' (1008) with group `jerry (1008)' ...
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 []: maria abdul malik
    Room Number []: 000000000000
    Work Phone []: 00000000000000000000
    Home Phone []: 00000000000000000000
    Other []: 00000000000000000000
chfn: fields too long
fatal: `/bin/chfn jerry' returned error code 1. Exiting.
```

- **task4_scooby_su_auth_failure.png**

```
maria06@maria076:~$ su - Scooby
Password:
su: Authentication failure
        [root@maria076 ~]
```

- **task4_set_password_scooby.png**

```
maria06@maria076:~$ sudo passwd Scooby
New password:
Retype new password:
passwd: password updated successfully
```

- **task4_scooby_su_no_home.png**

```
maria06@maria076:~$ su - Scooby
Password:
su: warning: cannot change directory to /home/Scooby: No such file or directory
```

- **task4_scooby_no_home.png**

```
maria06:x:1000:1000:maria abdul malik:/home/maria06:/bin/bash
sshd:x:109:65534::/run/sshd:/usr/sbin/nologin
tom:x:1001:1001:maria abdul malik,12,03490014290,03490014290,0000000000:/home/t
Scooby:x:1002:1005::/home/Scooby:/bin/sh
Jerry:x:1003:1006::/home/Jerry:/bin/sh
scooby:x:1007:1007:maria abdul malik,00,00000000000000,00000000000000,000000000
jerry:x:1008:1008::/home/jerry:/bin/bash
```

- **task4_scooby_create_home.png**

```
maria06@maria076:~$ sudo mkdir -p /home/Scooby
maria06@maria076:~$ sudo Chown Scooby:Scooby /home/Scooby
sudo: Chown: command not found
maria06@maria076:~$ sudo chmod 750 /home/Scooby
maria06@maria076:~$ ls -ld /home/Scooby
drwxr-x--- 2 root root 4096 Nov  7 13:46 /home/Scooby
```

- **task4_scooby_login_success.png**

```
maria06@maria076:~$ pwd
/home/maria06
maria06@maria076:~$ ls -la
total 44
drwxr-x--- 6 maria06 maria06 4096 Oct 17 09:50 .
drwxr-xr-x  7 root    root   4096 Nov  7 13:46 ..
-rw-rw-r--  1 maria06 maria06 103 Oct 17 06:23 answer.md
-rw-r----- 1 maria06 maria06 143 Oct 17 09:50 .bash_history
-rw-r--r--  1 maria06 maria06 220 Mar 31 2024 .bash_logout
-rw-r--r--  1 maria06 maria06 3771 Mar 31 2024 .bashrc
drwx----- 2 maria06 maria06 4096 Oct 11 06:29 .cache
drwxrwxr-x  3 maria06 maria06 4096 Oct 17 06:27 lab4
drwxrwxr-x  3 maria06 maria06 4096 Oct 17 06:16 .local
-rw-r--r--  1 maria06 maria06 807 Mar 31 2024 .profile
drwx----- 2 maria06 maria06 4096 Oct 17 03:26 .ssh
-rw-r--r--  1 maria06 maria06     0 Oct 11 07:01 .sudo_as_admin_successful
```

- **task4_verify_users.png**

```
maria06:x:1000:1000:maria abdul malik:/home/maria06:/bin/bash
sshd:x:109:65534::/run/sshd:/usr/sbin/nologin
tom:x:1001:1001:maria abdul malik,12,03490014290,03490014290,000000
Scooby:x:1002:1005::/home/Scooby:/bin/sh
Jerry:x:1003:1006::/home/Jerry:/bin/sh
scooby:x:1007:1007:maria abdul malik,00,00000000000000,00000000000000
jerry:x:1008:1008::/home/jerry:/bin/bash
```

- **task4_shell_switching.png**

```
maria06:x:1000:1000:maria abdul malik:/home/maria06:/bin/bash
sshd:x:109:65534::/run/sshd:/usr/sbin/nologin
tom:x:1001:1001:maria abdul malik,12,03490014290,03490014290,000000
Scooby:x:1002:1005::/home/Scooby:/bin/sh
Jerry:x:1003:1006::/home/Jerry:/bin/sh
scooby:x:1007:1007:maria abdul malik,00,00000000000000,00000000000000
jerry:x:1008:1008::/home/jerry:/bin/bash
```

- **task4_add_groups.png**

```
maria06:x:1000:  
tom:x:1001:tom  
developer:x:1002:  
devops:x:1003:  
designer:x:1004:  
Scooby:x:1005:  
Jerry:x:1006:  
scooby:x:1007:  
jerry:x:1008:  
jolly:x:1009:  
anime:x:1010:
```

- **task4_delete_groups & users.png**

```
maria06@maria076:~$ sudo delgroup jolly  
info: Removing group `jolly' ...  
maria06@maria076:~$ sudo groupdel anime  
maria06@maria076:~$ cat /etc/groupt  
cat: /etc/groupt: No such file or directory  
maria06@maria076:~$ sudo deluser --remove-home Jerryy  
fatal: The user `Jerryy' does not exist.  
maria06@maria076:~$ sudo -r Scooby  
usage: sudo -h | -K | -k | -V  
usage: sudo -v [-ABkNnS] [-g group] [-h host] [-p prompt] [-u user]  
usage: sudo -l [-ABkNnS] [-g group] [-h host] [-p prompt] [-U user]  
      [-u user] [command [arg ...]]  
usage: sudo [-ABbEHkNnP] [-r role] [-t type] [-C num] [-D directory]  
      [-g group] [-h host] [-p prompt] [-R directory] [-T timeout]  
      [-u user] [VAR=value] [-i | -s] [command [arg ...]]  
usage: sudo -e [-ABkNnS] [-r role] [-t type] [-C num] [-D directory]  
      [-g group] [-h host] [-p prompt] [-R directory] [-T timeout]  
      [-u user] file ...  
maria06@maria076:~$ cat /etc/paswud  
cat: /etc/paswud: No such file or directory
```

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

- **task5_create_student.png**

```
maria06@maria076:~$ sudo adduser student  
[sudo] password for maria06:  
Sorry, try again.  
[sudo] password for maria06:  
info: Adding user `student' ...  
info: Selecting UID/GID from range 1000 to 59999 ...  
info: Adding new group `student' (1009) ...  
info: Adding new user `student' (1009) with group `student (1009)' ...  
info: Creating home directory `/home/student' ...  
info: Copying files from `/etc/skel' ...  
New password:  
Retype new password:  
passwd: password updated successfully  
Changing the user information for student  
Enter the new value, or press ENTER for the default  
    Full Name []: student 011  
    Room Number []: 12  
    Work Phone []: 0987  
    Home Phone []: 6758494  
    Other []: 000000  
Is the information correct? [y/n] y  
info: Adding new user `student' to supplemental / extra groups `users' ...  
info: Adding user `student' to group `users' ...
```

- **task5_create_files.png**

```
maria06@maria076:~$ su - Student
su: user Student does not exist or the user entry does no
maria06@maria076:~$ touch file1
maria06@maria076:~$ mkdir -p dir1
maria06@maria076:~$ touch dir1/file2
maria06@maria076:~$ ls -l
total 12
-rw-rw-r-- 1 maria06 maria06 103 Oct 17 06:23 answer.md
drwxrwxr-x 2 maria06 maria06 4096 Nov 7 14:18 dir1
-rw-rw-r-- 1 maria06 maria06 0 Nov 7 14:18 file1
drwxrwxr-x 3 maria06 maria06 4096 Oct 17 06:27 lab4
```

- **task5_chown& chgrp_file1.png**

```
maria06@maria076:~$ sudo chown tom file1
maria06@maria076:~$ ls -l file1
-rw-rw-r-- 1 tom maria06 0 Nov 7 14:18 file1
maria06@maria076:~$ sudo chgrp devops file1
maria06@maria076:~$ ls -l file1
-rw-rw-r-- 1 devops maria06 0 Nov 7 14:18 file1
```

- **task5_file_types.png**

```
maria06@maria076:~$ ls -l
total 12
-rw-rw-r-- 1 maria06 maria06 103 Oct 17 06:23 answer.md
drwxrwxr-x 2 maria06 maria06 4096 Nov 7 14:18 dir1
-rw-rw-r-- 1 tom devops 0 Nov 7 14:18 file1
drwxrwxr-x 3 maria06 maria06 4096 Oct 17 06:27 lab4
maria06@maria076:~$ ls -l dir1
total 0
-rw-rw-r-- 1 maria06 maria06 0 Nov 7 14:18 file2
maria06@maria076:~$ ls -l /dev/null
crw-rw-r- 1 root root 1, 3 Nov 7 11:36 /dev/null
maria06@maria076:~$ file file1 dir1 /dev/null
file1: empty
dir1: directory
/dev/null: character special (1/3)
```

Task 6 – Change permissions using symbolic mode

- **task6_su_student.png**

```
maria06@maria076:~$ su - student
Password:
```

```
maria06@maria076:~$ cd ~
maria06@maria076:~$ ls -l file1
-rw-rw-r-- 1 maria06 maria06 0 Nov 7 15:09 file1
```

- **task6_chmod_remove_rwx.png**

```
maria06@maria076:~$ chmod -rwx file1
maria06@maria076:~$ ls -l file1
----- 1 maria06 maria06 0 Nov 7 15:09 file1
```

- task6_chmod_add_r.png

```
maria06@maria076:~$ chmod +r file1
maria06@maria076:~$ ls -l file1
-r--r--r-- 1 maria06 maria06 0 Nov  7 15:09 file1
```

- task6_chmod_u_plus_x.png

```
maria06@maria076:~$ chmod u+x file1
maria06@maria076:~$ ls -l file1
-rwxr--r-- 1 maria06 maria06 0 Nov  7 15:09 file1
maria06@maria076:~$
```

- task6_chmod_ug_plus_w.png

```
maria06@maria076:~$ chmod ug+w file1
maria06@maria076:~$ ls -l file1
-rw-rw-r-- 1 maria06 maria06 0 Nov  7 15:09 file1
```

- task6_chmod_ugo_minus_rwx.png

```
maria06@maria076:~$ chmod ugo-rwx file1
maria06@maria076:~$ ls -l file1
----- 1 maria06 maria06 0 Nov  7 15:09 file1
```

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

- task7_student_context.png

```
maria06@maria076:~$ su - student
Password:
```

- task7_chmod_set_all_rwx.png

```
maria06@maria076:~$ chmod u=rwx,g=rwx,o=rwx file1
maria06@maria076:~$ ls -l file1
-rwxrwxrwx 1 maria06 maria06 0 Nov  7 15:09 file1
```

- task7_remove_exec_go.png

```
maria06@maria076:~$ chmod g=rw,o=rw file1
maria06@maria076:~$ ls -l file1
-rwxrw-rw- 1 maria06 maria06 0 Nov  7 15:09 file1
```

- task7_remove_all_perms.png

```
maria06@maria076:~$ chmod u=,g=,o= file1
maria06@maria076:~$ ls -l file1
----- 1 maria06 maria06 0 Nov  7 15:09 file1
```

Task 8 – Change permissions using numeric (octal) mode

- task8_student_context.png

```
student@maria076:~$ su - student
Password:
student@maria076:~$ cd ~
student@maria076:~$ ls -l file1
-rw-rw-r-- 1 student student 0 Nov  8 05:30 file1
```

- task8_chmod_777.png

```
student@maria076:~$ chmod 777 file1
student@maria076:~$ ls -l file1
-rwxrwxrwx 1 student student 0 Nov  8 05:30 file1
```

- task8_chmod_700.png

```
student@maria076:~$ chmod 700 file1
student@maria076:~$ ls -l file1
-rwx----- 1 student student 0 Nov  8 05:30 file1
```

- task8_chmod_744.png

```
student@maria076:~$ chmod 744 file1
student@maria076:~$ ls -l file1
-rwxr--r-- 1 student student 0 Nov  8 05:30 file1
```

- task8_chmod_640.png

```
student@maria076:~$ chmod 640 file1
student@maria076:~$ ls -l file1
-rw-r----- 1 student student 0 Nov  8 05:30 file1
```

- task8_chmod_664.png

```
student@maria076:~$ chmod 664 file1
student@maria076:~$ ls -l file1
-rw-rw-r-- 1 student student 0 Nov  8 05:30 file1
```

- task8_chmod_775.png

```
student@maria076:~$ chmod 775 file1
student@maria076:~$ ls -l file1
-rwxrwxr-x 1 student student 0 Nov  8 05:30 file1
```

- task8_chmod_750.png

```
student@maria076:~$ chmod 750 file1
student@maria076:~$ ls -l file1
-rwxr-x--- 1 student student 0 Nov  8 05:30 file1
```

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

- task9_grep_less.png

```
2025-11-07T11:28:11.066951+00:00 maria076 apt.systemd.daily[28721]: pid = os.fork()
2025-11-07T11:28:11.910120+00:00 maria076 multipathd[27973]: sda: triggering change event to reinitialize
2025-11-07T11:28:11.946889+00:00 maria076 multipath: sda: failed to get sysfs uid: No such file or directory
2025-11-07T11:28:11.947064+00:00 maria076 multipath: sda: failed to get sgio uid: No such file or directory
2025-11-07T11:28:11.978273+00:00 maria076 multipathd[27973]: sda: failed to get sysfs uid: No such file or directory
2025-11-07T11:28:11.978382+00:00 maria076 multipathd[27973]: sda: failed to get sgio uid: No such file or directory
2025-11-07T11:28:11.978440+00:00 maria076 multipathd[27973]: sda: failed to get path uid
2025-11-07T11:28:11.978481+00:00 maria076 multipathd[27973]: uevent trigger error
2025-11-07T11:28:17.651731+00:00 maria076 apt.systemd.daily[28721]: /usr/bin/unattended-upgrade:567: DeprecationWarning: fork() may lead to deadlocks in the child.
2025-11-07T11:28:17.652258+00:00 maria076 apt.systemd.daily[28721]: pid = os.fork()
2025-11-07T11:28:21.917952+00:00 maria076 multipathd[27973]: sda: not initialized after 3 udev retriggers
2025-11-07T11:28:22.922313+00:00 maria076 multipathd[27973]: sda: add missing path
2025-11-07T11:28:22.926576+00:00 maria076 multipathd[27973]: sda: failed to get sysfs uid: No such file or directory
```

- task9_grep_more.png

```
k (ConditionFileIsExecutable=/usr/bin/ovs-vsctl).
2025-11-07T11:27:55.709516+00:00 maria076 systemd[1]: logrotate.service: Deactivated successfully.
2025-11-07T11:27:55.711227+00:00 maria076 systemd[1]: Finished logrotate.service - Rotate log files.
2025-11-07T11:27:55.775277+00:00 maria076 fwupd[28455]: 11:27:55.774 FuMain fwupd 1.9.31 ready for requests (locale en_US.UTF-8)
2025-11-07T11:27:55.778158+00:00 maria076 dbus-daemon[768]: [system] Successfully activated service 'org.freedesktop/fwupd'
2025-11-07T11:27:55.779674+00:00 maria076 systemd[1]: Started fwupd.service - Firmware update daemon.
2025-11-07T11:27:55.869496+00:00 maria076 fwupdMgr[28352]: Updating lvfs
2025-11-07T11:27:55.887195+00:00 maria076 systemd[1]: fwupd-refresh.service: Main process exited, code=exited, status=1/FAILURE
2025-11-07T11:27:55.888677+00:00 maria076 systemd[1]: fwupd-refresh.service: Failed with result 'exit-code'.
2025-11-07T11:27:55.888304+00:00 maria076 systemd[1]: Failed to start fwupd-refresh.service - Refresh fwupd metadata and update motd.
2025-11-07T11:27:56.103209+00:00 maria076 kernel: e1000: ens33 NIC Link is Up 1000 Mbps Full
Duplex, Flow Control: None
2025-11-07T11:27:56.109036+00:00 maria076 systemd-networkd[28337]: ens33: Gained carrier
2025-11-07T11:27:57.176870+00:00 maria076 systemd-networkd[28337]: ens33: DHCPv4 address 192.168.153.130/24, gateway 192.168.153.2 acquired from
2025-11-07T11:27:57.187327+00:00 maria076 systemd-timesyncd[17729]: Network configuration changed, trying to establish connection.
--More--
```

- task9_grep_head.png

```

maria06@maria076:~$ sudo grep -E 'fail|error' /var/log/syslog | head
2025-11-07T11:28:01.951579+00:00 maria076 multipath: sda: failed to get sysfs uid: No such file or directory
2025-11-07T11:28:01.951927+00:00 maria076 multipath: sda: failed to get sgio uid: No such file or directory
2025-11-07T11:28:01.985298+00:00 maria076 multipathd[27973]: sda: failed to get udev uid: No data available
2025-11-07T11:28:01.985445+00:00 maria076 multipathd[27973]: sda: failed to get path uid
2025-11-07T11:28:01.985511+00:00 maria076 multipathd[27973]: uevent trigger error
2025-11-07T11:28:11.946889+00:00 maria076 multipath: sda: failed to get sysfs uid: No such file or directory
2025-11-07T11:28:11.947064+00:00 maria076 multipath: sda: failed to get sgio uid: No such file or directory
2025-11-07T11:28:11.978273+00:00 maria076 multipathd[27973]: sda: failed to get sysfs uid: No such file or directory
2025-11-07T11:28:11.978382+00:00 maria076 multipathd[27973]: sda: failed to get sgio uid: No such file or directory
2025-11-07T11:28:11.978440+00:00 maria076 multipathd[27973]: sda: failed to get path uid

```

- task9_redirect_overwrite.png

```

maria06@maria076:~$ sudo grep -i systemd /var/log/syslog > ~/syslog_systemd.txt

```

- task9_redirect_append.png

```

maria06@maria076:~$ sudo grep -i network /var/log/syslog >> ~/syslog_systemd.txt
maria06@maria076:~$ cat ~/syslog_systemd.txt
2025-11-07T11:27:55.659799+00:00 maria076 systemd[1]: netplan-ovs-cleanup.service - OpenVSwitch configuration for cleanup was skipped because of an unmet condition check (ConditionFileIsExecutable=/usr/bin/ovs-vsctl).
2025-11-07T11:27:55.709516+00:00 maria076 systemd[1]: logrotate.service: Deactivated successfully.
2025-11-07T11:27:55.711227+00:00 maria076 systemd[1]: Finished logrotate.service - Rotate log files.
2025-11-07T11:27:55.779674+00:00 maria076 systemd[1]: Started fwupd.service - Firmware update daemon.
2025-11-07T11:27:55.887195+00:00 maria076 systemd[1]: fwupd-refresh.service: Main process exited, code=exited, status=1/FAILURE
2025-11-07T11:27:55.887677+00:00 maria076 systemd[1]: fwupd-refresh.service: Failed with result 'exit-code'.
2025-11-07T11:27:55.888304+00:00 maria076 systemd[1]: Failed to start fwupd-refresh.service - Refresh fwupd metadata and update mtd.
2025-11-07T11:27:56.109036+00:00 maria076 systemd-networkd[28337]: ens3: Gained carrier
2025-11-07T11:27:57.176878+00:00 maria076 systemd-networkd[28337]: ens3: DHCPv4 address 192.168.153.24 acquired from 192.168.153.254
2025-11-07T11:27:57.187327+00:00 maria076 systemd-timesyncd[17729]: Network configuration changed, trying to establish connection.
2025-11-07T11:27:57.388428+00:00 maria076 systemd-timesyncd[17729]: Contacted time server 185.125.198.56:123 (ntp.ubuntu.com).
2025-11-07T11:27:58.082636+00:00 maria076 systemd-networkd[28337]: ens3: Gained IPv6LL
2025-11-07T11:28:02.283499+00:00 maria076 apt.systemd.daily[28721]: /usr/bin/unattended-upgrade:567: DeprecationWarning: This process (pid=28721) is multi-threaded, use of fork() may lead to deadlocks in the child.
2025-11-07T11:28:02.284449+00:00 maria076 apt.systemd.daily[28721]: pid = os.fork()
2025-11-07T11:28:11.066683+00:00 maria076 apt.systemd.daily[28721]: /usr/bin/unattended-upgrade:567: DeprecationWarning: This process (pid=28721) is multi-threaded, use of fork() may lead to deadlocks in the child.
2025-11-07T11:28:11.066951+00:00 maria076 apt.systemd.daily[28721]: pid = os.fork()
2025-11-07T11:28:17.651731+00:00 maria076 apt.systemd.daily[28721]: /usr/bin/unattended-upgrade:567: DeprecationWarning: This process (pid=28721) is multi-threaded, use of fork() may lead to deadlocks in the child.
2025-11-07T11:28:17.652258+00:00 maria076 apt.systemd.daily[28721]: pid = os.fork()
2025-11-07T11:28:31.147521+00:00 maria076 apt.systemd.daily[28721]: /usr/bin/unattended-upgrade:567: DeprecationWarning: This process (pid=28721) is multi-threaded, use of fork() may lead to deadlocks in the child.

```

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

- task10_b1_vim.png

```

maria06@maria076: ~
#!/bin/bash
~

```

- task10_b1_run.png

```

maria06@maria076:~$ chmod +x setup.sh
maria06@maria076:~$ ./setup.sh
maria06@maria076:~$ _

```

- task10_b2_vim.png

```
maria06@maria076: ~
#!/bin/bash
var1="hello from lab 6"
echo "var1: $var1"
~
```

- task10_b2_run.png

```
maria06@maria076:~$ ./setup.sh
var1: hello from lab 6
maria06@maria076:~$
```

- task10_b3_vim.png

```
maria06@maria076: ~
# Save ls -l to variable and display
allFiles=$(ls -l)
echo "allFiles (ls -l):"
echo "$allFiles"
~
```

- task10_b3_run.png

```
maria06@maria076:~$ maria06@maria076:~$ ./setup.sh
allFiles (ls -l):
total 116
-rw-rw-r-- 1 maria06 maria06 103 Oct 17 06:23 answer.md
drwxrwxr-x 2 maria06 maria06 4096 Nov  7 14:18 dir1
-rw-rwxrwx 1 maria06 maria06 0 Nov  7 15:09 file1
drwxrwxr-x 3 maria06 maria06 4096 Oct 17 06:27 lab4
-rw-rwxr-x 1 maria06 maria06 101 Nov  8 08:33 setup.sh
-rw-rw-r-- 1 maria06 maria06 99620 Nov  8 06:34 syslog_systemd.txt
```

- task10_b4_vim.png

```
maria06@maria076: ~
# 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
```

- task10_b4_run.png

```
maria06@maria076:~$ maria06@maria076:~$ ./setup.sh
Directory dir1 exists.
maria06@maria076:~$
```

- task10_b5_vim.png

```
maria06@maria076: ~
# 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
```

- task10_b5_run.png

```
maria06@maria076:~/~$ ./setup.sh
file2 already exists.
```

- task10_b6_vim.png

```
maria06@maria076: ~
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"
```

- task10_b6_run.png

```
maria06@maria076:~/~$ ./setup.sh
Execute permission missing; granting to user...
Final permissions for dir1/file2:
-rwxrwxr-- 1 maria06 maria06 0 Nov  7 14:18 dir1/file2
maria06@maria076:~$
```

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

- task11_b0_vim.png

```
[ch] maria06@maria076: ~  
#!/bin/bash  
num=$1  
str=$2  
~
```

- task11_b0_run.png

```
@maria076:~$ maria06@maria076:~$ chmod +x setup.sh  
@maria076:~$ ./setup.sh 10 Student  
~
```

- task11_b1_vim.png

```
[ch] maria06@maria076: ~  
if [ "$num" -eq 10 ]; then  
    echo "$num is equal to 10 (-eq)."  
else  
    echo "$num is NOT equal to 10 (-eq)."  
fi  
~
```

- task11_b1_run.png

```
maria06@maria076:~/ $ ./setup.sh 10 Student  
./setup.sh: line 1: [: : integer expression expected  
is NOT equal to 10 (-eq).  
maria06@maria076:~/ $ ./setup.sh 7 Student  
./setup.sh: line 1: [: : integer expression expected  
is NOT equal to 10 (-eq).  
maria06@maria076:~/ ~
```

- task11_b2_vim.png

```
[ch] maria06@maria076: ~  
if [ "$num" -ne 10 ]; then  
    echo "$num is not equal to 10 (-ne)."  
else  
    echo "$num is equal to 10 (-ne false)."  
fi  
~
```

- task11_b2_run.png

```
maria06@maria076:~/ $ ./setup.sh 7 Student  
./setup.sh: line 1: [: : integer expression expected  
is equal to 10 (-ne false).  
maria06@maria076:~/ $ ./setup.sh 10 Student  
./setup.sh: line 1: [: : integer expression expected  
is equal to 10 (-ne false).  
maria06@maria076:~/ ~
```

- task11_b3_vim.png

```
maria06@maria076: ~
if [ "$num" -gt 10 ]; then
    echo "$num is greater than 10 (-gt)."
else
    echo "$num is NOT greater than 10 (-gt)."
fi_
~
```

- task11_b3_run.png

```
maria06@maria076:~$ ./setup.sh 12 Student
./setup.sh: line 1: [: : integer expression expected
is NOT greater than 10 (-gt).
maria06@maria076:~$ ./setup.sh 9 Student
./setup.sh: line 1: [: : integer expression expected
is NOT greater than 10 (-gt).
maria06@maria076:~$
```

- task11_b4_vim.png

```
maria06@maria076: ~
if [ "$num" -lt 10 ]; then
    echo "$num is less than 10 (-lt)."
else
    echo "$num is NOT less than 10 (-lt)."
fi_
~
```

- task11_b4_run.png

```
maria06@maria076:~$ ./setup.sh 5 Student
./setup.sh: line 1: [: : integer expression expected
is NOT less than 10 (-lt).
maria06@maria076:~$ ./setup.sh 11 Student
./setup.sh: line 1: [: : integer expression expected
is NOT less than 10 (-lt).
maria06@maria076:~$
```

- task11_b5_vim.png

```
maria06@maria076: ~
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_
~
```

- task11_b5_run.png

```
maria06@maria076:~$ ./setup.sh 10 Student
./setup.sh: line 1: [: : integer expression expected
is NOT greater than or equal to 10 (-ge).
maria06@maria076:~$ ./setup.sh 8 Student
./setup.sh: line 1: [: : integer expression expected
is NOT greater than or equal to 10 (-ge).
maria06@maria076:~$
```

- task11_b6_vim.png

```
#!/bin/bash
num=$1
str=$2
if [ "$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
~
```

- task11_b7_vim.png

```
#!/bin/bash
num=$1
str=$2
if [ "$str" = "Student" ]; then
    echo "Second argument equals 'Student' ( = )."
else
    echo "Second argument does NOT equal 'Student' ( = )."
fi
~
~
```

- task11_b8_vim.png

```
#!/bin/bash
num=$1
str=$2
if [ "$str" != "Student" ]; then
    echo "Second argument is not equal to 'Student' ( != )."
else
    echo "Second argument equals 'Student' ( != false)."
fi
~
```

- task11_b8_run.png

```
~$ sara@sara050:~$ ./setup.sh 10 test
test is not equal to 'Student' ( != )..
~$ ./setup.sh 10 Student
test equals 'Student' ( != false)..
~$
```

- task11_b9_vim.png

```
#!/bin/bash
num=$1
str=$2
if [ -z "$str" ]; then
    echo "Second argument is empty (zero-length)."
else
    echo "Second argument is not empty."
fi
~
```

- task11_b9_run.png

```
vim setup.sh
./setup.sh 10 Student
is not empty.
./setup.sh 10
is empty (zero-length).
```

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

- task12_b2_vim.png

```
## Script to demonstrate printing all user-entered arguments
# Print all arguments using $*
echo "Printing all arguments using \$*:"
for arg in $*; do
    echo "Argument: $arg"
done
~
```

- task12_b2_run.png

```
Printing all arguments using $*:
Argument: one
Argument: two
Argument: words
Argument: three
[0:0:0.05s] ~
```

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

- task13_b1_vim.png

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

- task13_b1_run.png

```
~$ ./setup.sh
~$
```

- task13_b2_vim.png

```
# While-loop summation (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"
```

- task13_b2_run.png

```
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
```

- task13_b3_vim.png

```
# 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
```

- task13_b3_run.png

```

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

```

- task13_b4_vim.png

```

# 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"

```

- task13_b4_run.png

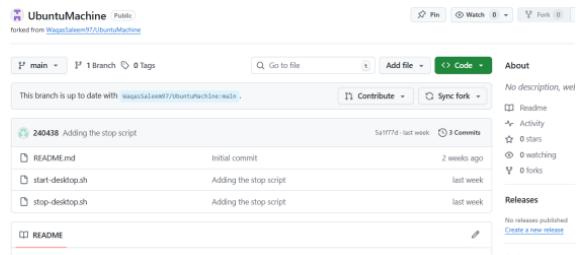
```

Now demonstrating sum_args function:
sum_args(3,4) returned: 7

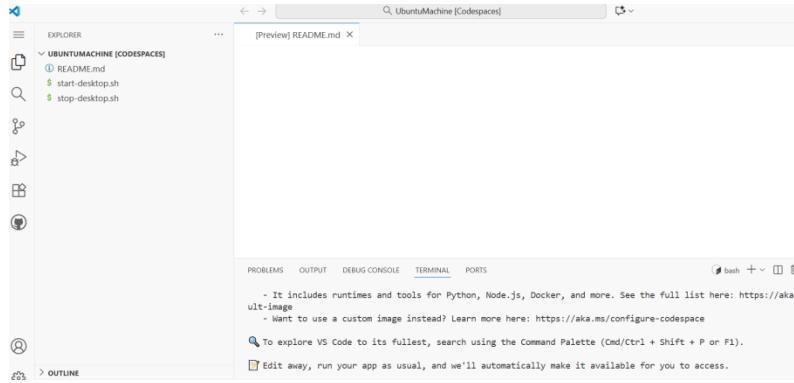
```

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

- task14_fork.png



- task14_codespace_launch.png



- task14_start_script_ls.png

```
-rwxrwxrwx 1 codespace root 1333 Nov 6 09:36 start-desktop.sh
-rwxrwxrwx 1 codespace root 428 Nov 6 09:36 stop-desktop.sh
```

- task14_start_run.png

```
79 packages can be upgraded. Run 'apt list --upgradable' to see them.
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
xfce4 is already the newest version (4.18).
xfce4-goodies is already the newest version (4.18.2build1).
x11vnc is already the newest version (0.9.16-10).
xvfb is already the newest version (2:21.1.12-1ubuntu1.5).
novnc is already the newest version (1:1.3.0-2).
websockify is already the newest version (0.10.0+dfsg1-5build2).
dbus-x11 is already the newest version (1.14.10-4ubuntu4.1).
x11-xserver-utils is already the newest version (7.7+10build2).
0 upgraded, 0 newly installed, 0 to remove and 79 not upgraded.
[✓] Xfce desktop environment is running!
🌐 Access it via the Codespaces HTTPS port (6080)
```

- task14_ports_view.png

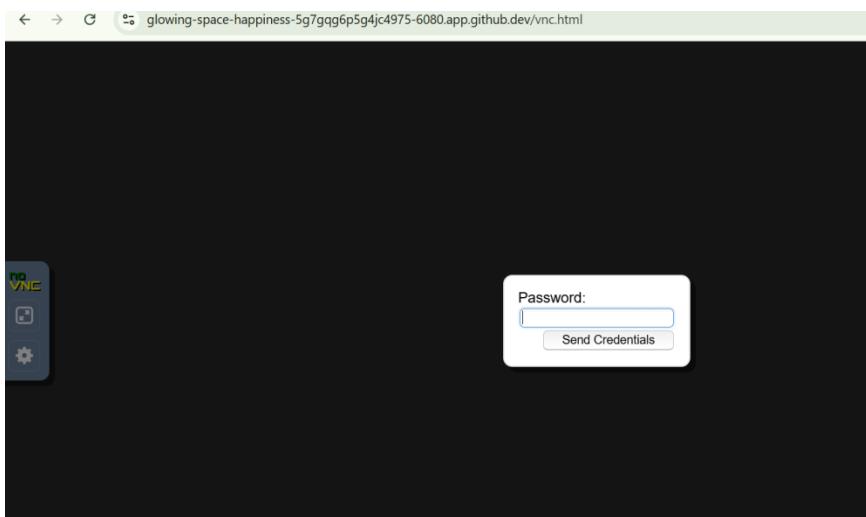
Port	Forwarded Address	Running Process	Visibility	Origin
5900	https://glowing-spa...	x11vnc -display :1 -rfbauth /home/codespac...	⊕ Public	Auto Forwarded
5901	https://glowing-spa...	x11vnc -display :1 -rfbauth /home/codespac...	⊕ Private	Auto Forwarded
6080	https://glowing-spa...	/usr/bin/python3 /usr/bin/websockify --web...	⊕ Private	Auto Forwarded
Add Port				

- task14_vnc_url.png

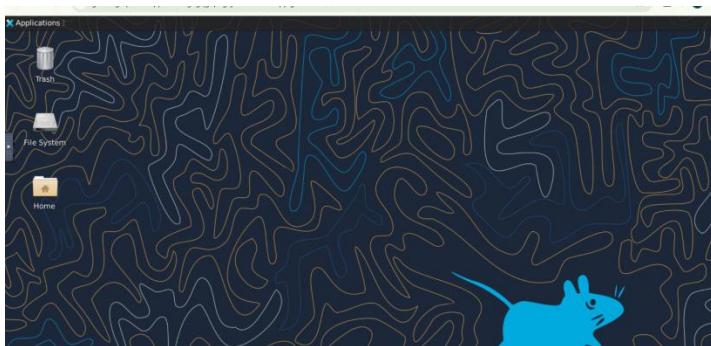


- [app/](#)
- [core/](#)
- [include/](#)
- [utils/](#)
- [vendor/](#)
- [vnc.html](#)
- [vnc_auto.html@](#)
- [vnc_lite.html](#)

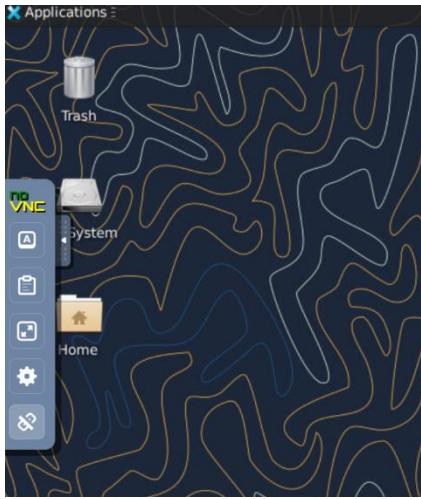
- task14_vnc_password_prompt.png



- task14_vnc_desktop.png



- task14_vnc_connect.png



- task14_stop_run.png

```
[*] Stopping noVNC server...
Terminating WebSockets proxy (21483)
[*] Stopping x11vnc server...
In exit
Terminating child 23304
Process Process-34:
caught signal: 15
[*] Stopping XFCE desktop session...
```