



Fatima Jinnah Women University

Opening Portals of Excellence Through Higher Education

CLOUD COMPUTING LAB 6

Linux Users, Groups, Permissions, Pipes, and Bash Scripting

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Task 1: Create Private GitHub Repository

task1_set_root_password.png

```
maham123@maham123:~$ sudo passwd root
[sudo] password for maham123:
Sorry, try again.
[sudo] password for maham123:
New password:
Retype new password:
passwd: password updated successfully
maham123@maham123:~$ _
```

task1_su_root.png

```
maham123@maham123:~$ su -
Password:
root@maham123:~# whoami
root
root@maham123:~# id
uid=0(root) gid=0(root) groups=0(root)
root@maham123:~# _
```

task1_exit_to_user.png

```
uid=0(root) gid=0(root) groups=0(root)
root@maham123:~# exit
logout
maham123@maham123:~$ whoami
maham123
maham123@maham123:~$ _
```

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

task2_adduser_tom.png

```
maham123$  
maham123@maham123:~$ 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' ...  
maham123@maham123:~$
```

task2_verify_passwd.png

```
sshd:x:109:65534::/run/sshd:/usr/sbin/nologin  
maham123:x:1000:1000:Maham:/home/maham123:/bin/bash  
rtkit:x:110:110:RealtimeKit,,,:/proc:/usr/sbin/nologin  
dnsmasq:x:999:65534:dnsmasq:/var/lib/misc:/usr/sbin/nologin  
lightdm:x:111:112:Light Display Manager:/var/lib/lightdm:/bin/false  
whoopsie:x:112:114::/nonexistent:/bin/false  
avahi:x:113:118:Avahi mDNS daemon,,,:/run/avahi-daemon:/usr/sbin/nologin  
saned:x:114:119::/var/lib/saned:/usr/sbin/nologin  
colord:x:115:120:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin  
cups-pk-helper:x:116:121:user for cups-pk-helper service,,,:/nonexistent:/usr/sbin/nologin  
pulse:x:117:122:PulseAudio daemon,,,:/run/pulse:/usr/sbin/nologin  
cups-browsed:x:118:121::/nonexistent:/usr/sbin/nologin  
xrdp:x:119:124::/run/xrdp:/usr/sbin/nologin  
flatpak:x:120:125:Flatpak system-wide installation helper,,,:/nonexistent:/usr/sbin/nologin  
tom:x:1001:1001:,,,:/home/tom:/bin/bash  
maham123@maham123:~$  
maham123@maham123:~$
```

task2_verify_group.png

```
netdev:x:115:  
bluetooth:x:116:  
scanner:x:117:saned  
avahi:x:118:  
saned:x:119:  
colord:x:120:  
lpadmin:x:121:  
pulse:x:122:  
pulse-access:x:123:  
xrdp:x:124:  
_flatpak:x:125:  
tom:x:1001:  
maham123@maham123:~$
```

task2_verify_shadow.png

```
ssmdu:::z0364:::::  
maham123:$6$cYqPuG9CJIxXkPYq$XYB0QsPFPaQpWqqNE7oBjlgEEETJKRNPiA6Kvv0Yqj04whhCZJKEHMSyxG70Bji  
rtkit::!20385:::::  
dnsmasq::!20385:::::  
lightdm::!20385:::::  
whoopsie::!20385:::::  
avahi::!20385:::::  
saned::!20385:::::  
colord::!20385:::::  
cups-pk-helper::!20385:::::  
pulse::!20385:::::  
cups-browsed::!20385:::::  
xrdp::!20385:::::  
_flatpak::!20392:::::  
tom:$y$j9T$iykd2g.O65mcXtVev1aCq0$pJ7tPhpsfD71qWlVgS1LwfnIPuIRrzCmaEwon/FUzm9:20395:0:99999:  
maham123@maham123:~$
```

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

task3_groupadd.png

```
scanner:x:117:saned  
avahi:x:118:  
saned:x:119:  
colord:x:120:  
lpadmin:x:121:  
pulse:x:122:  
pulse-access:x:123:  
xrdp:x:124:  
_flatpak:x:125:  
tom:x:1001:  
developer:x:1002:  
devops:x:1003:  
designer:x:1004:  
maham123@maham123:~$
```

task3_change_primary_group.png

```
maham123@maham123:~$ sudo usermod -g designer tom  
  
maham123@maham123:~$ sudo usermod -g designer tom  
  
usermod: no changes  
maham123@maham123:~$ id tom  
uid=1001(tom) gid=1004(designer) groups=1004(designer),100(users)  
maham123@maham123:~$  
maham123@maham123:~$
```

task3_add_secondary_groups.png

```
maham123@maham123:~$ sudo usermod -aG developer,devops tom  
  
maham123@maham123:~$ id tom  
uid=1001(tom) gid=1004(designer) groups=1004(designer),100(users),1002(developer),1003(devop  
maham123@maham123:~$ groups tom  
tom : designer users developer devops  
maham123@maham123:~$
```

task3_reset_secondary_groups.png

```
maham123@maham123:~$ sudo usermod -G tom tom  
  
maham123@maham123:~$ id tom  
uid=1001(tom) gid=1004(designer) groups=1004(designer),1001(tom)  
maham123@maham123:~$ groups tom  
tom : designer tom  
maham123@maham123:~$
```

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

task4_add_users.png

```
tom : designer tom  
maham123@maham123:~$ sudo adduser Jerry  
[sudo] password for maham123:  
err: Please enter a username matching the regular expression  
      configured via the NAME_REGEX configuration variable. Use the  
      '--allow-bad-names' option to relax this check or reconfigure  
      NAME_REGEX in configuration.  
maham123@maham123:~$ sudo useradd Scooby  
maham123@maham123:~$
```

task4_scooby_su_auth_failure.png

```
maham123@maham123:~$ su - Scooby
Password:
mahu: Authentication failure
maham123@maham123:~$ _
```

task4_set_password_scooby.png

```
mahu: Authentication failure
maham123@maham123:~$ sudo passwd Scooby

New password:
Retype new password:
passwd: password updated successfully
maham123@maham123:~$ _
```

task4_scooby_su_no_home.png

```
password: password updated successfully
maham123@maham123:~$ su - Scooby

Password:
su: Authentication failure
maham123@maham123:~$ _
```

task4_scooby_no_home.png

```
cups-browsed:x:110:121::/nonexistent:/usr/sbin/nologin
xrdp:x:119:124::/run/xrdp:/usr/sbin/nologin
_flatpak:x:120:125:Flatpak system-wide installation helper,,,:/nonexistent:/usr/sbin/nologin
tom:x:1001:1004:,,,:/home/tom:/bin/bash
Scooby:x:1002:1005::/home/Scooby:/bin/sh
maham123@maham123:~$ ls -ld /home/Scooby
ls: cannot access '/home/Scooby': No such file or directory
maham123@maham123:~$ _
```

task4_scooby_create_home.png

```
[root] cannot access '/home/Scooby' : No such file or directory
maham123@maham123:~$ sudo mkdir -p /home/Scooby
[sudo] password for maham123:
maham123@maham123:~$ sudo chown Scooby:Scooby /home/Scooby
maham123@maham123:~$ sudo chmod 750 /home/Scooby
maham123@maham123:~$ ls -ld /home/Scooby
drwxr-x--- 2 Scooby Scooby 4096 Nov  3 18:31 /home/Scooby
maham123@maham123:~$ _
```

task4_scooby_login_success.png

```
maham123@maham123:~$ su - Scooby
Password:
$ pwd
/home/Scooby
$ ls -la
total 12
drwxr-x--- 3 Scooby Scooby 4096 Nov  3 18:34 .
drwxr-xr-x  5 root   root   4096 Nov  3 18:31 ..
drwx----- 2 Scooby Scooby 4096 Nov  3 18:34 .cache
$ ^[S
```

task4_verify_users.png

```
saned:x:114:119::/var/lib/saned:/usr/sbin/nologin
colord:x:115:120:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
cups-pk-helper:x:116:121:user for cups-pk-helper service,,,:/nonexistent:/usr/sbin/nologin
pulse:x:117:122:PulseAudio daemon,,,:/run/pulse:/usr/sbin/nologin
cups-browsed:x:118:121::/nonexistent:/usr/sbin/nologin
xrdp:x:119:124::/run/xrdp:/usr/sbin/nologin
_flatpak:x:120:125:Flatpak system-wide installation helper,,,:/nonexistent:/usr/sbin/nologin
tom:x:1001:1004:,,,:/home/tom:/bin/bash
Scooby:x:1002:1005::/home/Scooby:/bin/sh
maham123@maham123:~$
```

task4_shell_switching.png

```
tom:x:1001:1004:,,,:/home/tom:/bin/bash
Scooby:x:1002:1005::/home/Scooby:/bin/sh
maham123@maham123:~$ sudo usermod -s /bin/bash Scooby
maham123@maham123:~$ su - Scooby
Password:
Scooby@maham123:~$
```

task4_add_groups.png

```
maham123: command not found
maham123@maham123:~$ sudo addgroup jolly
info: Selecting GID from range 1000 to 59999 ...
info: Adding group `jolly' (GID 1006) ...
maham123@maham123:~$ sudo groupadd anime
maham123@maham123:~$
```

task4_verify_groups.png

```
_flatpak:x:123:  
tom:x:1001:tom  
developer:x:1002:  
devops:x:1003:  
designer:x:1004:  
Scooby:x:1005:  
jolly:x:1006:  
anime:x:1007:  
maham123@maham123:~$  
maham123@maham123:~$
```

task4_delete_groups.png

```
pulse:x:122:  
pulse-access:x:123:  
xrdp:x:124:  
_flatpak:x:125:  
tom:x:1001:tom  
developer:x:1002:  
devops:x:1003:  
designer:x:1004:  
Scooby:x:1005:  
maham123@maham123:~$
```

task4_delete_users.png

```
saned:x:114:119::/var/lib/saned:/usr/sbin/nologin  
colord:x:115:120:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin  
cups-pk-helper:x:116:121:user for cups-pk-helper service,,,:/nonexistent:/usr/sbin/nologin  
pulse:x:117:122:PulseAudio daemon,,,:/run/pulse:/usr/sbin/nologin  
cups-browsed:x:118:121::/nonexistent:/usr/sbin/nologin  
xrdp:x:119:124::/run/xrdp:/usr/sbin/nologin  
_flatpak:x:120:125:Flatpak system-wide installation helper,,,:/nonexistent:/usr/sbin/nologin  
tom:x:1001:1004:,,,:/home/tom:/bin/bash  
maham123@maham123:~$
```

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

task5_create_student.png

```
        NAME_REGEX in configuration.  
maham123@maham123:~$ 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:  
No password has been supplied.  
New password:
```

task5_create_files.png

```
maham123@maham123:~$ su - student
Password:
su: Authentication failure
maham123@maham123:~$ touch file1
maham123@maham123:~$ mkdir -p dir1
maham123@maham123:~$ touch dir1/file2
maham123@maham123:~$ ls -l
total 52
-rw-rw-r-- 1 maham123 maham123 488 Oct 24 08:50 apt_update_vs_upgrade.md
drwxr-xr-x 2 maham123 maham123 4096 Oct 24 09:15 Desktop
drwxrwxr-x 2 maham123 maham123 4096 Nov  3 18:58 dir1
drwxr-xr-x 2 maham123 maham123 4096 Oct 24 09:15 Documents
drwxr-xr-x 2 maham123 maham123 4096 Oct 24 09:15 Downloads
-rw-rw-r-- 1 maham123 maham123     0 Nov  3 18:58 file1
drwxrwxr-x 2 maham123 maham123 4096 Nov  1 12:32 Lab5
drwxr-xr-x 2 maham123 maham123 4096 Oct 24 09:15 Music
drwxr-xr-x 2 maham123 maham123 4096 Oct 24 09:15 Pictures
drwxr-xr-x 2 maham123 maham123 4096 Oct 24 09:15 Public
drwx----- 3 maham123 maham123 4096 Oct 24 08:55 snap
drwxr-xr-x 2 maham123 maham123 4096 Oct 24 09:15 Templates
drwxrwxr-t 2 maham123 maham123 4096 Oct 24 09:15 thinclient_drives
drwxr-xr-x 2 maham123 maham123 4096 Oct 24 09:15 Videos
maham123@maham123:~$
```

task5_chown_file1.png

```
maham123@maham123:~$ sudo chown tom file1
maham123@maham123:~$ ls -l file1
-rw-rw-r-- 1 tom maham123 0 Nov  3 18:58 file1
maham123@maham123:~$
```

task5_chgrp_file1.png

```
rw-rw-r-- 1 tom maham123 0 Nov  3 18:58 file1
maham123@maham123:~$ sudo chgrp devops file1
maham123@maham123:~$ ls -l file1
-rw-rw-r-- 1 tom devops 0 Nov  3 18:58 file1
maham123@maham123:~$
```

task5_file_types.png

```
total 52
-rw-rw-r-- 1 maham123 maham123 488 Oct 24 08:50 apt_update_vs_upgrade.md
drwxr-xr-x 2 maham123 maham123 4096 Oct 24 09:15 Desktop
drwxrwxr-x 2 maham123 maham123 4096 Nov  3 18:58 dir1
drwxr-xr-x 2 maham123 maham123 4096 Oct 24 09:15 Documents
drwxr-xr-x 2 maham123 maham123 4096 Oct 24 09:15 Downloads
-rw-rw-r-- 1 tom      devops     0 Nov  3 18:58 file1
drwxrwxr-x 2 maham123 maham123 4096 Nov  1 12:32 Lib5
drwxr-xr-x 2 maham123 maham123 4096 Oct 24 09:15 Music
drwxr-xr-x 2 maham123 maham123 4096 Oct 24 09:15 Pictures
drwxr-xr-x 2 maham123 maham123 4096 Oct 24 09:15 Public
drwx----- 3 maham123 maham123 4096 Oct 24 08:55 snap
drwxr-xr-x 2 maham123 maham123 4096 Oct 24 09:15 Templates
drwxrwxr-x 2 maham123 maham123 4096 Oct 24 09:15 thinclient_drives
drwxr-xr-x 2 maham123 maham123 4096 Oct 24 09:15 Videos
maham123@maham123:~$ ls -l dir1
total 0
-rw-rw-r-- 1 maham123 maham123 0 Nov  3 18:58 file2
maham123@maham123:~$ ls -l /dev/null
crw-rw-rw- 1 root  root 1, 3 Nov  3 09:53 /dev/null
maham123@maham123:~$ file file1 dir1 /dev/null
file1:      empty
dir1:      directory
/dev/null: character special (1/3)
maham123@maham123:~$ _
```

task5_exit_student.png

```
*** System restart required ***
maham123@maham123:~$ _
```

Task 6 – Change permissions using symbolic mode

task6_su_student.png

```
maham123@maham123:~$ su - student
Password:
su: Authentication failure
maham123@maham123:~$ cd ~
maham123@maham123:~$ ls -l file1
-rw-rw-r-- 1 tom devops 0 Nov  3 18:58 file1
maham123@maham123:~$ _
```

task6_chmod_remove_rwx.png

```
-rw-rw-r-- 1 tom devops 0 Nov  3 18:58 file1
maham123@maham123:~$ chmod -rwx file1
chmod: changing permissions of 'file1': Operation not permitted
maham123@maham123:~$ ls -l file1
-rw-rw-r-- 1 tom devops 0 Nov  3 18:58 file1
maham123@maham123:~$
```

task6_chmod_add_r.png

```
-rw-rw-r-- 1 tom devops 0 Nov  3 18:58 file1
maham123@maham123:~$ chmod +r file1
chmod: changing permissions of 'file1': Operation not permitted
maham123@maham123:~$ ls -l file1
-rw-rw-r-- 1 tom devops 0 Nov  3 18:58 file1
maham123@maham123:~$
```

task6_chmod_u_plus_x.png

```
-rw-rw-r-- 1 tom devops 0 Nov  3 18:58 file1
maham123@maham123:~$ chmod u+x file1
chmod: changing permissions of 'file1': Operation not permitted
maham123@maham123:~$ ls -l file1
-rw-rw-r-- 1 tom devops 0 Nov  3 18:58 file1
maham123@maham123:~$ _
```

task6_chmod_ug_plus_w.png

```
-rw-rw-r-- 1 tom devops 0 Nov  3 18:58 file1
maham123@maham123:~$ chmod ug+w file1
chmod: changing permissions of 'file1': Operation not permitted
maham123@maham123:~$ ls -l file1
-rw-rw-r-- 1 tom devops 0 Nov  3 18:58 file1
maham123@maham123:~$ _
```

task6_chmod_ugo_minus_rwx.png

```
maham123@maham123:~$ chmod ugo-rwx file1
chmod: changing permissions of 'file1': Operation not permitted
maham123@maham123:~$ ls -l file1
-rw-rw-r-- 1 tom devops 0 Nov  3 18:58 file1
maham123@maham123:~$
```

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

task7_student_context.png

```
rw-rw-r-- 1 tom devops 0 Nov 3 18:58 file1
maham123@maham123:~$ su - student
Password:
su: Authentication failure
maham123@maham123:~$ cd ~
maham123@maham123:~$ ls -l file1
-rw-rw-r-- 1 tom devops 0 Nov 3 18:58 file1
maham123@maham123:~$
```

task7_chmod_set_all_rwx.png

```
-rw-rw-r-- 1 tom devops 0 Nov 3 18:58 file1
maham123@maham123:~$ chmod u=rwx,g=rwx,o=rwx file1
chmod: changing permissions of 'file1': Operation not permitted
maham123@maham123:~$ ls -l file1
-rw-rw-r-- 1 tom devops 0 Nov 3 18:58 file1
maham123@maham123:~$
```

task7_remove_exec_go.png

```
rw-rw-r-- 1 tom devops 0 Nov 3 18:58 file1
maham123@maham123:~$ chmod g=rw,o=rw file1
chmod: changing permissions of 'file1': Operation not permitted
maham123@maham123:~$ ls -l file1
-rw-rw-r-- 1 tom devops 0 Nov 3 18:58 file1
maham123@maham123:~$
```

task7_remove_all_perms.png

```
rw-rw-r-- 1 tom devops 0 Nov 3 18:58 file1
maham123@maham123:~$ chmod u=,g=,o= file1
chmod: changing permissions of 'file1': Operation not permitted
maham123@maham123:~$ ls -l file1
-rw-rw-r-- 1 tom devops 0 Nov 3 18:58 file1
maham123@maham123:~$
```

Task 8 – Change permissions using numeric (octal) mode

task8_student_context.png

```
rw-rw-r-- 1 tom devops 0 Nov 3 18:58 file1
maham123@maham123:~$ su - student
Password:
su: Authentication failure
maham123@maham123:~$ cd ~
maham123@maham123:~$ ls -l file1
-rw-rw-r-- 1 tom devops 0 Nov 3 18:58 file1
maham123@maham123:~$
```

task8_chmod_777.png

```
-rw-rw-r-- 1 tom devops 0 Nov  3 18:58 file1
maham123@maham123:~$ chmod 777 file1
chmod: changing permissions of 'file1': Operation not permitted
maham123@maham123:~$ ls -l file1
-rw-rw-r-- 1 tom devops 0 Nov  3 18:58 file1
maham123@maham123:~$
```

task8_chmod_700.png

```
-rw-rw-r-- 1 tom devops 0 Nov  3 18:58 file1
maham123@maham123:~$ chmod 700 file1
chmod: changing permissions of 'file1': Operation not permitted
maham123@maham123:~$ ls -l file1
-rw-rw-r-- 1 tom devops 0 Nov  3 18:58 file1
```

task8_chmod_744.png

```
-rw-rw-r-- 1 tom devops 0 Nov  3 18:58 file1
maham123@maham123:~$ chmod 744 file1
chmod: changing permissions of 'file1': Operation not permitted
maham123@maham123:~$ ls -l file1
-rw-rw-r-- 1 tom devops 0 Nov  3 18:58 file1
```

task8_chmod_640.png

```
-rw-rw-r-- 1 tom devops 0 Nov  3 18:58 file1
maham123@maham123:~$ chmod 640 file1
chmod: changing permissions of 'file1': Operation not permitted
maham123@maham123:~$ ls -l file1
-rw-rw-r-- 1 tom devops 0 Nov  3 18:58 file1
```

task8_chmod_664.png

```
-rw-rw-r-- 1 tom devops 0 Nov  3 18:58 file1
maham123@maham123:~$ chmod 664 file1
chmod: changing permissions of 'file1': Operation not permitted
maham123@maham123:~$ ls -l file1
-rw-rw-r-- 1 tom devops 0 Nov  3 18:58 file1
```

task8_chmod_775.png

```
-rw-rw-r-- 1 tom devops 0 Nov  3 18:58 file1
maham123@maham123:~$ chmod 775 file1
chmod: changing permissions of 'file1': Operation not permitted
maham123@maham123:~$ ls -l file1
-rw-rw-r-- 1 tom devops 0 Nov  3 18:58 file1
```

ask8_chmod_750.png

```
[~] tom devops ~ Nov 3 18:58 file1
maham123@maham123:~$ chmod 750 file1
chmod: changing permissions of 'file1': Operation not permitted
maham123@maham123:~$ ls -l file1
-rw-rw-r-- 1 tom devops 0 Nov 3 18:58 file1
```

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

task9_grep_less.png

```
02:01.0': not supported by any plugin
2025-10-31T18:10:02.839937+00:00 maham123 systemd[1]: dmesg.service: Deactivated successfully.
2025-10-31T18:10:03.541010+00:00 maham123 xrdp[1419]: [INFO ] starting xrdp with pid 1419
2025-10-31T18:10:03.541900+00:00 maham123 xrdp[1419]: [INFO ] address [0.0.0.0] port [3389] mode [tcp]
2025-10-31T18:10:03.543300+00:00 maham123 xrdp[1419]: [INFO ] listening to port 3389 on 0.0.0.0
2025-10-31T18:10:03.545040+00:00 maham123 xrdp[1419]: [INFO ] xrdp_listen_pp done
2025-10-31T18:10:04.996430+00:00 maham123 multipathd[478]: sda: triggering change event to reinit
2025-10-31T18:10:05.047287+00:00 maham123 multipath: sda: failed to get sysfs uid: No such file or directory
2025-10-31T18:10:05.047491+00:00 maham123 multipath: sda: failed to get sgio uid: No such file or directory
maham123@maham123:~$
```

task9_grep_more.png

```
--More--
02:01.0': not supported by any plugin
2025-10-31T18:10:02.596099+00:00 maham123 systemd[1]: systemd-update-utmp-runlevel.service: Deactivated successfully.
2025-10-31T18:10:02.596257+00:00 maham123 systemd[1]: Finished systemd-update-utmp-runlevel.service
2025-10-31T18:10:02.598509+00:00 maham123 systemd[1]: Startup finished in 5.328s (kernel) + 8.244ms (userspace)
2025-10-31T18:10:02.829106+00:00 maham123 ModemManager[1196]: <msg> [base-manager] couldn't ch
02:01.0': not supported by any plugin
2025-10-31T18:10:02.839937+00:00 maham123 systemd[1]: dmesg.service: Deactivated successfully.
2025-10-31T18:10:03.541010+00:00 maham123 xrdp[1419]: [INFO ] starting xrdp with pid 1419
2025-10-31T18:10:03.541900+00:00 maham123 xrdp[1419]: [INFO ] address [0.0.0.0] port [3389] mode [tcp]
2025-10-31T18:10:03.543300+00:00 maham123 xrdp[1419]: [INFO ] listening to port 3389 on 0.0.0.0
2025-10-31T18:10:03.545040+00:00 maham123 xrdp[1419]: [INFO ] xrdp_listen_pp done
2025-10-31T18:10:04.996430+00:00 maham123 multipathd[478]: sda: triggering change event to reinit
2025-10-31T18:10:05.047287+00:00 maham123 multipath: sda: failed to get sysfs uid: No such file or directory
2025-10-31T18:10:05.047491+00:00 maham123 multipath: sda: failed to get sgio uid: No such file or directory
```

task9_grep_head.png

```
2025-10-31T18:10:05.067091+00:00 maham123 multipathd[478]: sda: failed to get udev uid: No such file or directory
2025-10-31T18:10:05.067216+00:00 maham123 multipathd[478]: sda: failed to get path uid
2025-10-31T18:10:05.067229+00:00 maham123 multipathd[478]: uevent trigger error
2025-10-31T18:10:15.081083+00:00 maham123 multipath: sda: failed to get sysfs uid: No such file or directory
2025-10-31T18:10:15.081164+00:00 maham123 multipath: sda: failed to get sgio uid: No such file or directory
2025-10-31T18:10:15.096259+00:00 maham123 multipathd[478]: sda: failed to get udev uid: No such file or directory
2025-10-31T18:10:15.096301+00:00 maham123 multipathd[478]: sda: failed to get path uid
2025-10-31T18:10:15.096313+00:00 maham123 multipathd[478]: uevent trigger error
maham123@maham123:~$
```

task9_redirect_overwrite.png

```
2025-10-31T18:10:15.096313+00:00 maham123 multipathd[478]: uevent trigger error
maham123@maham123:~$ sudo grep -i systemd /var/log/syslog > ~/syslog_systemd.txt
maham123@maham123:~$
```

task9_redirect_append.png

```
level 11 Oct 18 21:40:37.888632+00:00 maham123 NetworkManager[1153]: <info> [1762248647.6219] dev...
2025-11-03T18:21:40.378575+00:00 maham123 systemd-timesyncd[677]: Network configuration change
2025-11-03T18:21:40.382896+00:00 maham123 systemd-networkd[652]: ens3: DHCPv4 address 192.168
2025-11-03T18:21:40.384764+00:00 maham123 systemd-timesyncd[677]: Network configuration change
2025-11-03T18:28:48.145817+00:00 maham123 systemd[1541]: Closed dirmngr.socket - GnuPG network
2025-11-03T18:29:02.846181+00:00 maham123 systemd[9389]: Listening on dirmngr.socket - GnuPG n
2025-11-03T18:36:40.299491+00:00 maham123 systemd-timesyncd[677]: Network configuration change
2025-11-03T18:51:39.863220+00:00 maham123 systemd-timesyncd[677]: Network configuration change
2025-11-03T19:04:19.828865+00:00 maham123 systemd[9389]: Closed dirmngr.socket - GnuPG network
2025-11-03T19:04:24.416126+00:00 maham123 systemd[9732]: Listening on dirmngr.socket - GnuPG n
2025-11-03T19:06:40.021334+00:00 maham123 systemd-timesyncd[677]: Network configuration change
2025-11-04T09:30:47.623518+00:00 maham123 NetworkManager[1153]: <info> [1762248647.6219] audi
on="Already awake"
2025-11-04T09:32:51.090699+00:00 maham123 systemd-timesyncd[677]: Network configuration change
maham123@maham123:~$
```

task9_journalctl_alternative.png

```
Oct 03 06:37:41 maham123 kernel: incomplete guidai flushes, disabling PCID
Oct 03 06:37:41 maham123 kernel: RAMDISK: [mem 0x2f5b9000-0x33ad3fff]
Oct 03 06:37:41 maham123 kernel: ACPI: Early table checksum verification disabled
Oct 03 06:37:41 maham123 kernel: ACPI: RSDP 0x000000000000F6A00 000024 (v02 PTLTD )
Oct 03 06:37:41 maham123 kernel: ACPI: XSDT 0x0000000007FEE965B 00005C (v01 INTEL 440BX 060
Oct 03 06:37:41 maham123 kernel: ACPI: FACP 0x0000000007FEFEE73 0000F4 (v04 INTEL 440BX 060
Oct 03 06:37:41 maham123 kernel: ACPI: DSDT 0x0000000007FEEAD55 01411E (v01 PTLTD Custom 060
Oct 03 06:37:41 maham123 kernel: ACPI: FACS 0x0000000007FEFFFFC0 000040
maham123@maham123:~$ sudo journalctl -u systemd | grep -i error > ~/journal_errors.txt
maham123@maham123:~$ 
maham123@maham123:~$
```

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

task10_b1_run.png

```
"setup.sh" [New] 0L, 0B written
maham123@maham123:~$ chmod +x setup.sh
maham123@maham123:~$ ./setup.sh
maham123@maham123:~$
```

task10_b1_vim.png

```
E486: Pattern not found: bin
```

task10_b2_vim.png

```
# Define and show var1

var1="Hello from Lab 6
echo "var1: $var1"
```

task10_b2_run.png

```
"setup.sh" 7L, 69B written
maham123@maham123:~$ ./setup.sh
var1: Hello from Lab 6
maham123@maham123:~$
```

task10_b3_run.png

```
"setup.sh" 12L, 128B written
maham123@maham123:~$ ./setup.sh
allFiles (ls -l):
total 224
-rw-rw-r-- 1 maham123 maham123      488 Oct 24 08:50 apt_update_vs_upgrade.md
drwxr-xr-x  2 maham123 maham123     4096 Oct 24 09:15 Desktop
drwxrwxr-x  2 maham123 maham123     4096 Nov  3 18:58 dir1
drwxr-xr-x  2 maham123 maham123     4096 Oct 24 09:15 Documents
drwxr-xr-x  2 maham123 maham123     4096 Oct 24 09:15 Downloads
-rw-rw-r--  1 tom      devops        0 Nov   3 18:58 file1
-rw-rw-r--  1 maham123 maham123        0 Nov   4 09:49 journal_errors.txt
drwxrwxr-x  2 maham123 maham123     4096 Nov   1 12:32 Lab5
drwxr-xr-x  2 maham123 maham123     4096 Oct 24 09:15 Music
drwxr-xr-x  2 maham123 maham123     4096 Oct 24 09:15 Pictures
drwxr-xr-x  2 maham123 maham123     4096 Oct 24 09:15 Public
-rwxrwxr-x  1 maham123 maham123      128 Nov   4 10:10 setup.sh
drwx----- 3 maham123 maham123     4096 Oct 24 08:55 snap
-rw-rw-r--  1 maham123 maham123  171455 Nov   4 09:47 syslog_systemd.txt
drwxr-xr-x  2 maham123 maham123     4096 Oct 24 09:15 Templates
drwxrwxr-t  2 maham123 maham123     4096 Oct 24 09:15 thinclient_drives
drwxr-xr-x  2 maham123 maham123     4096 Oct 24 09:15 Videos
maham123@maham123:~$
```

task10_b3_vim.png

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

task10_b4_vim.png

```
#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

```
"setup.sh" 17L, 210B written
maham123@mahami123:~$ ./setup.sh
Directory dir1 exists.
maham123@mahami123:~$
```

task10_b5_vim.png

```
# 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

```
"setup.sh" 17L, 224B written
maham123@maham123:~$ ./setup.sh

file2 already exists.
maham123@maham123:~$
```

task10_b6_vim.png

```
# 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 "$1" ]; then
    echo "Execute permission missing; granting to user..."
    chmod u+x "$1"
fi

echo "Final permissions for $1:"
ls -l "$1"
```

ask10_b6_run.png

```
"setup.sh" 35L, 515B written
maham123@maham123:~$ ./setup.sh
Execute permission missing; granting to user...
Final permissions for dir1/file2:
-rwxrw-r-- 1 maham123 maham123 0 Nov  3 18:58 dir1/file2
maham123@maham123:~$
```

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

task11_b0_vim.png

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

task11_b0_run.png

```
"setup.sh" 21L, 44B written
maham123@maham123:~$ hmod +x setup.sh
Command 'hmod' not found, did you mean:
  command 'mod' from deb monodoc-base (6.8.0.105+dfsg-3.2)
  command 'jmod' from deb openjdk-17-jdk-headless (17.0.16+8~us1-0ubuntu1~24.04.1)
  command 'jmod' from deb openjdk-21-jdk-headless (21.0.8+9~us1-0ubuntu1~24.04.1)
  command 'jmod' from deb openjdk-18-jdk-headless (18.0.2+9-2~22.04)
  command 'jmod' from deb openjdk-19-jdk-headless (19.0.2+7-0ubuntu3~22.04)
  command 'jmod' from deb openjdk-11-jdk-headless (11.0.28+6-1ubuntu1~24.04.1)
  command 'jmod' from deb openjdk-25-jdk-headless (25+36-1~24.04.2)
  command 'qmod' from deb gridengine-client (8.1.9+dfsg-10build1)
  command 'kmod' from deb kmod (29-1ubuntu1)
  command 'chmod' from deb coreutils (8.32-4.1ubuntu1.2)
Try: sudo apt install <deb name>
maham123@maham123:~$ ./setup.sh 10 student
maham123@maham123:~$ _
```

task11_b1_vim.png

```
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

```
"setup.sh" 29L, 139B written
maham123@maham123:~$ ./setup.sh 10 student
./setup.sh: line 2: [: : integer expression expected
is NOT equal to 10 (-eq).
maham123@maham123:~$ ./setup.sh 7 student
./setup.sh: line 2: [: : integer expression expected
is NOT equal to 10 (-eq).
maham123@maham123:~$ _
```

task11_b2_vim.png

```
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

```
"setup.sh" 32L, 148B written
maham123@maham123:~$ ./setup.sh 7 student
./setup.sh: line 4: [: : integer expression expected
is equal to 10 (-ne false).
maham123@maham123:~$ ./setup.sh 10 student
./setup.sh: line 4: [: : integer expression expected
is equal to 10 (-ne false).
maham123@maham123:~$ _
```

task11_b3_vim.png

```
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

```
"setup.sh" 35L, 155B written
maham123@maham123:~$ ./setup.sh 12 student
./setup.sh: line 8: [: : integer expression expected
is NOT greater than 10 (-gt).
maham123@maham123:~$ ./setup.sh 9 student
./setup.sh: line 8: [: : integer expression expected
is NOT greater than 10 (-gt).
maham123@maham123:~$ _
```

task11_b4_vim.png

```
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

```
"setup.sh" 38L, 150B written
maham123@maham123:~/> ./setup.sh 5 student
./setup.sh: line 8: [: : integer expression expected
is NOT less than 10 (-lt).
maham123@maham123:~/> ./setup.sh 11 student
./setup.sh: line 8: [: : integer expression expected
is NOT less than 10 (-lt).
maham123@maham123:~/>
```

task11_b5_vim.png

```
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

```
"setup.sh" 41L, 183B written
maham123@maham123:~$ ./setup.sh 10 student
./setup.sh: line 12: [: : integer expression expected
is NOT greater than or equal to 10 (-ge).
maham123@maham123:~$ ./setup.sh 8 student
./setup.sh: line 12: [: : integer expression expected
is NOT greater than or equal to 10 (-ge).
maham123@maham123:~$
```

task11_b6_vim.png

```
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_b6_run.png

```
"setup.sh" 44L, 180B written
maham123@maham123:~$ ./setup.sh 10 student
./setup.sh: line 8: [: : integer expression expected
is NOT less than or equal to 10 (-le).
maham123@maham123:~$ ./setup.sh 12 student
./setup.sh: line 8: [: : integer expression expected
is NOT less than or equal to 10 (-le).
maham123@maham123:~$
```

task11_b7_vim.png

```
if [ "$str" = "Student" ]; then
    echo "Second argument equals 'Student' ( = )."
else
    echo "Second argument does NOT equal 'Student' ( = )."
fi
```

task11_b7_run.png

```
"setup.sh" 47L, 194B written
maham123@maham123:~$ ./setup.sh 10 Student
Second argument does NOT equal 'Student' ( != ).
maham123@maham123:~$ ./setup.sh 10 student
Second argument does NOT equal 'Student' ( != ).
maham123@maham123:~$ ./setup.sh 10 Test
Second argument does NOT equal 'Student' ( != ).
```

task11_b8_vim.png

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

task11_b8_run.png

```
"setup.sh" 49L, 203B written
maham123@maham123:~$ ./setup.sh 10 Test
Second argument is not equal to 'Student' ( != ).
maham123@maham123:~$ ./setup.sh 10 Student
Second argument is not equal to 'Student' ( != ).
```

ask11_b9_vim.png

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

task11_b9_run.png

```
"setup.sh" 52L, 170B written
maham123@maham123:~$ ./setup.sh 10
Second argument is empty (zero-length).
maham123@maham123:~$ ./setup.sh 10 Student
Second argument is empty (zero-length).
maham123@maham123:~$
```

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

task12_b1_vim.png

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

task12_b1_run.png

```
"setup.sh" 42L, 120B written
maham123@maham123:~$ _
```

task12_b2_vim.png

```
# Print all arguments using $*
echo "Printing all arguments using \$*:""
for arg in $*; do
    echo "Argument: $arg"
donein/bash
```

task12_b2_run.png

```
"setup.sh" 49L, 178B written
maham123@maham123:~$ chmod +x setup.sh
maham123@maham123:~$ ./setup.sh one "two words" three
Printing all arguments using $*:
./setup.sh: line 50: syntax error: unexpected end of file
maham123@maham123:~$
```

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

task13_b1_vim.png

```
#!/bin/bash_
```

task13_b1_run.png

```
"setup.sh" 45L, 60B written
maham123@maham123:~$ chmod +x setup.sh
maham123@maham123:~$ ./setup.sh
maham123@maham123:~$
```

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

```
"setup.sh" 66L, 335B written
maham123@maham123:~$ ./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
maham123@maham123:~$
```

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

```
"setup.sh" 88L, 551B written
maham123@maham123:~$ ./setup.sh
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
maham123@maham123:~$
```

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

```
"setup.sh" 83L, 393B written
maham123@maham123:~$ chmod +x setup.sh
maham123@maham123:~$ ./setup.sh
./setup.sh: line 25: Demonstrate: command not found
Now demonstrating sum_args function:
sum_args(3,4) returned: 7
maham123@maham123:~$
```

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

task14_codespace_launch.png

Create a new fork

A *fork* is a copy of a repository. Forking a repository allows you to freely experiment with changes without affecting the original project. [View existing forks.](#)

Required fields are marked with an asterisk ().*

Owner * Repository name *

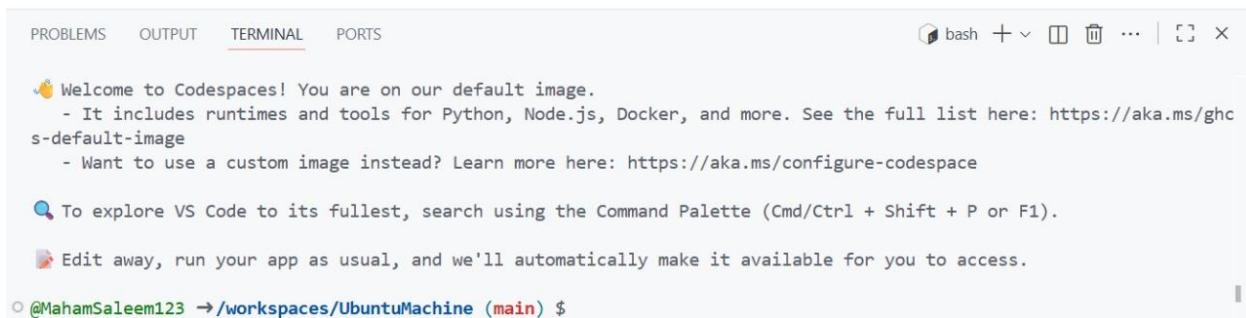
 MahamSaleem123 / UbuntuMachine

UbuntuMachine is available.

By default, forks are named the same as their upstream repository. You can customize the name to distinguish it further.

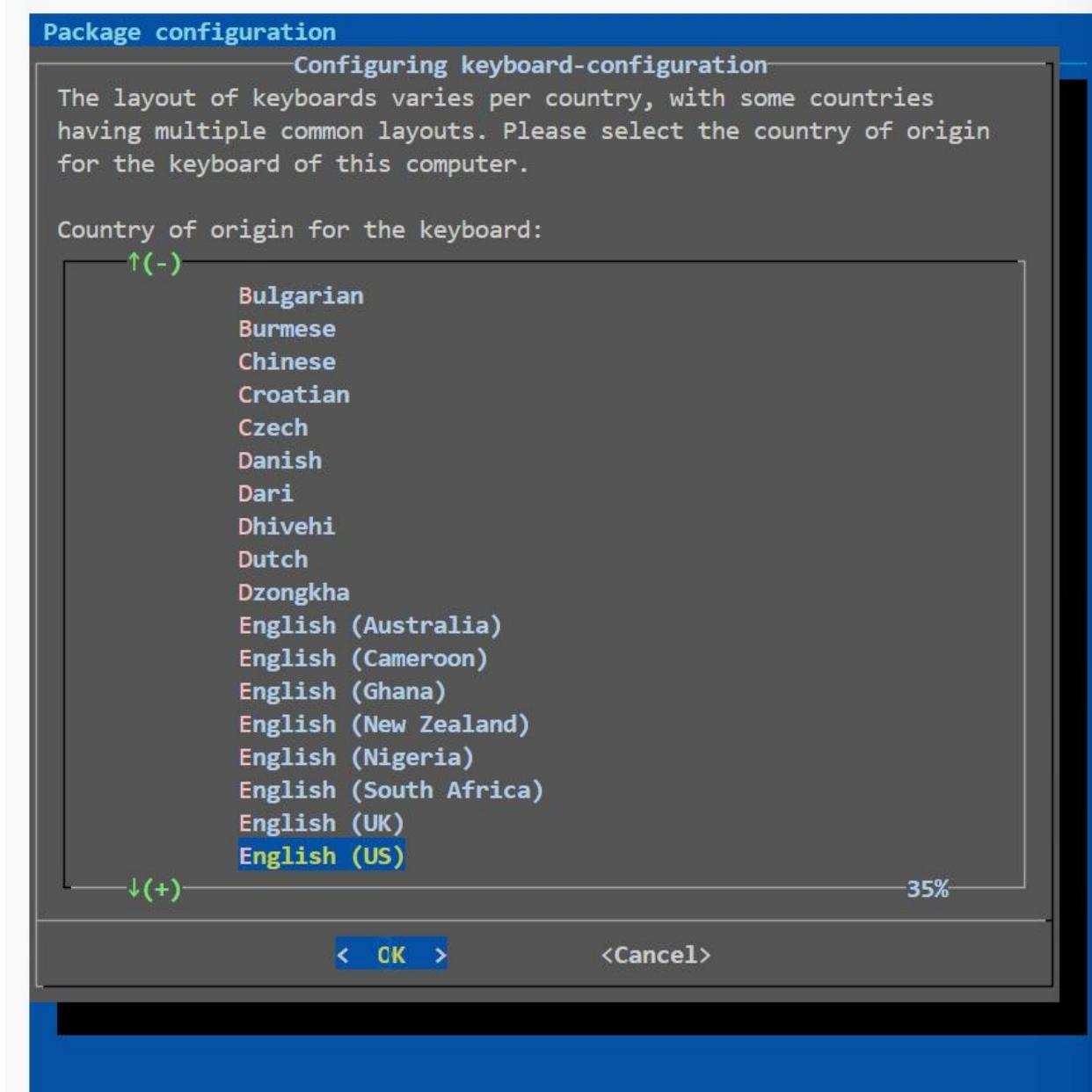
Description

task14_codespace_launch.png



task14_start_script_ls.png

```
● @MahamSaleem123 → /workspaces/UbuntuMachine (main) $ ls -l start-desktop.sh s  
top-desktop.sh  
-rwxrwxrwx 1 codespace root 1333 Nov  6 18:57 start-desktop.sh  
-rwxrwxrwx 1 codespace root  428 Nov  6 18:57 stop-desktop.sh  
○ @MahamSaleem123 → /workspaces/UbuntuMachine (main) $
```



task14_start_run.png

@MahamSaleem123 → /workspaces/UbuntuMachine (main) \$ WebSocket server setting
s:
- Listen on :6080
- Web server. Web root: /usr/share/novnc
- No SSL/TLS support (no cert file)
- proxying from :6080 to localhost:5901

(xfdesktop:21170) volume monitor wi ed
** (xfdesktop:211 ld not connect: N

Your application running on port 6080 is available. See all forwarded ports

Open in Browser Make Public

task14_ports_view.png

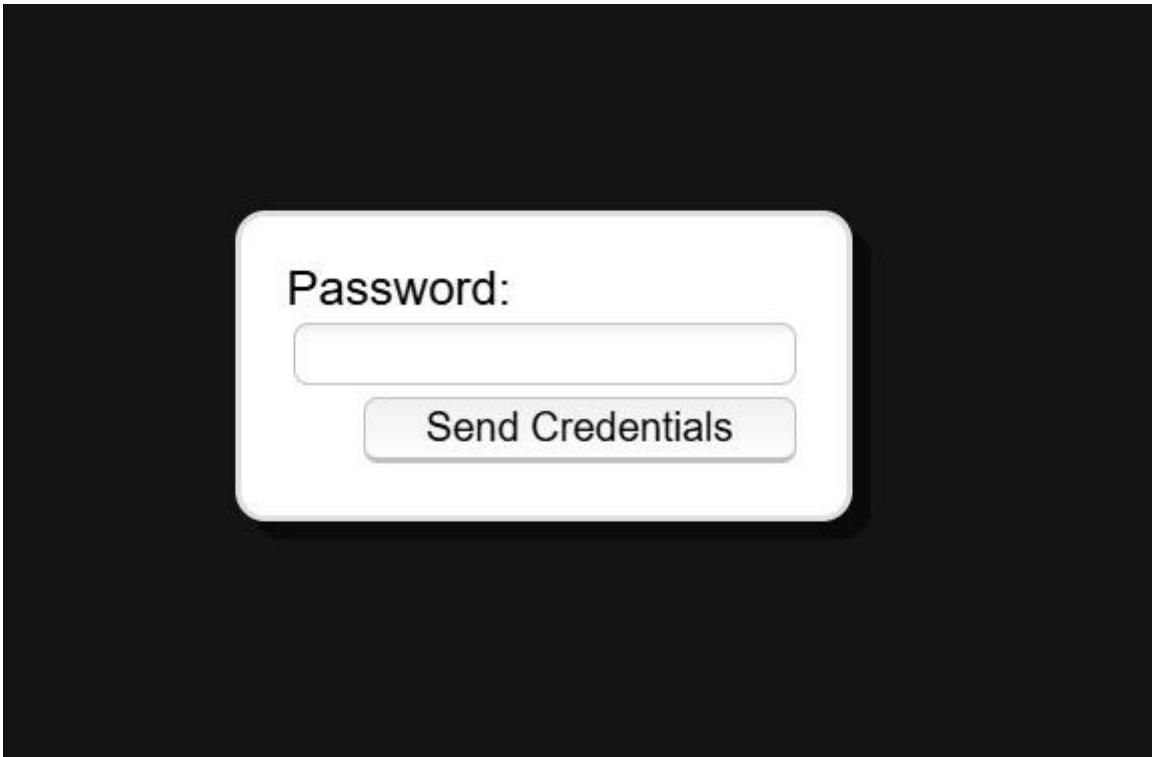
| Port | Forwarded Address | Running Process | Visibility | Origin |
|------|-------------------------|--|------------|----------------|
| 5900 | https://legendar... ↗ ⓘ | x1vnc -display :1 -rfbauth /home/codespace/.vnc/passw... | Private | Auto Forwarded |
| 5901 | https://legendar... ↗ ⓘ | x1vnc -display :1 -rfbauth /home/codespace/.vnc/passw... | Private | Auto Forwarded |
| 6080 | https://legendar... ↗ ⓘ | /usr/bin/python3 /usr/bin/websockify --web /usr/share/n... | Public | Auto Forwarded |

task14_vnc_url.png

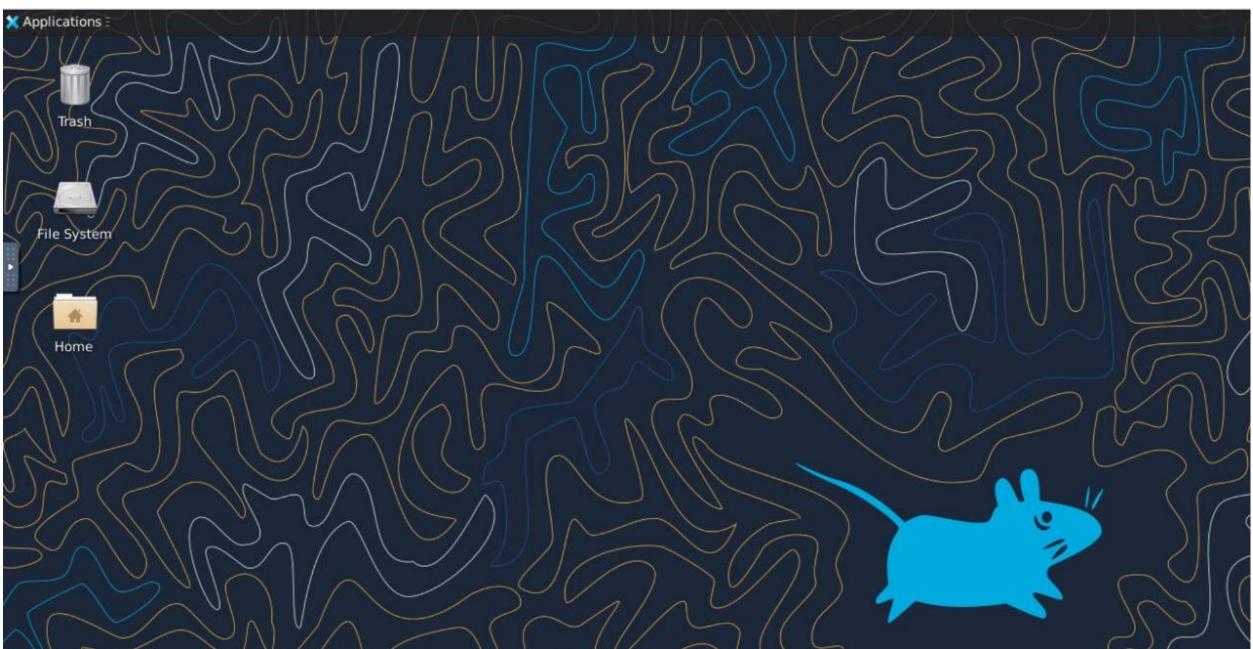
Directory listing for /

- [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

```
● @MahamSaleem123 → /workspaces/UbuntuMachine (main) $ ./stop-desktop.sh
[*] Stopping noVNC server...

Terminating WebSockets proxy (21317)
[*] Stopping x11vnc server...
In exit
caught signal: 15
06/11/2025 19:16:06 [*] Stopping XFCE desktop session...
deleted 60 tile_row polling images.
[*] Stopping virtual X server (Xvfb)...
```