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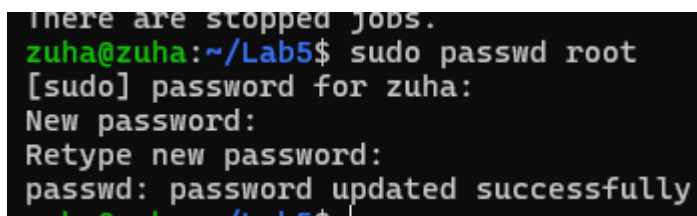
Subject: Cloud Computing

Semester & Section : V-B

Lab :06

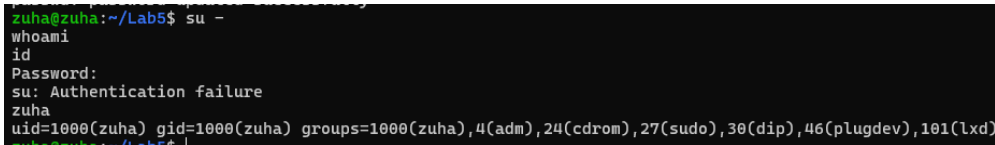
Task 1 – Switch to root with su - and back to a normal user

- task1_set_root_password.png



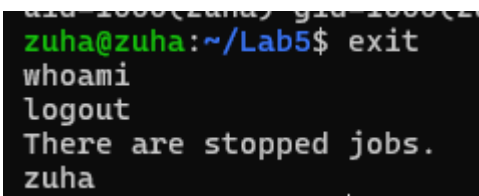
```
There are stopped jobs.
zuha@zuha:~/Lab5$ sudo passwd root
[sudo] password for zuha:
New password:
Retype new password:
passwd: password updated successfully
zuha@zuha:~/Lab5$
```

- task1_su_root.png



```
zuha@zuha:~/Lab5$ su -
whoami
id
Password:
su: Authentication failure
zuha
uid=1000(zuha) gid=1000(zuha) groups=1000(zuha),4(adm),24(cdrom),27(sudo),30(dip),46(plugdev),101(lxd)
zuha@zuha:~/Lab5$
```

- task1_exit_to_user.png



```
uid=1000(zuha) gid=1000(zuha) groups=1000(zuha),4(adm),24(cdrom),27(sudo),30(dip),46(plugdev),101(lxd)
zuha@zuha:~/Lab5$ exit
whoami
logout
There are stopped jobs.
zuha
zuha@zuha:~/Lab5$
```

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

- task2_adduser_tom.png

```

zuha
zuha@zuha:~/Lab5$ sudo adduser tom
[sudo] password for zuha:
Sorry, try again.
[sudo] password for zuha:
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 []: Zuha_Irfan
    Room Number []: 1
    Work Phone []: 03435902786
    Home Phone []: 1212
      Other []: xyz
Is the information correct? [Y/n] Y
info: Adding new user 'tom' to supplemental / extra groups 'users' ...
info: Adding user 'tom' to group 'users' ...
zuha@zuha:~/Lab5$

```

- task2_verify_passwd.png

```

zuha@zuha:~/Lab5$ 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
sshd:x:109:65534:/run/sshd:/usr/sbin/nologin
zuha:x:1000:1000:zuha:/home/zuha:/bin/bash
rtkit:x:110:110:RealtimeKit,,,:/proc:/usr/sbin/nologin
dnsmasq:x:999:65534:dnsmasq:/var/lib/misc:/usr/sbin/nologin
cups-pk-helper:x:111:111:user for cups-pk-helper service,,,:/nonexistent:/usr/sbin/nologin
lightdm:x:112:115:Light Display Manager:/var/lib/lightdm:/bin/false
whoopsie:x:113:117:/nonexistent:/bin/false
avahi:x:114:118:Avahi mDNS daemon,,,:/run/avahi-daemon:/usr/sbin/nologin
saned:x:115:120:/var/lib/saned:/usr/sbin/nologin
colord:x:116:121:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
pulse:x:117:122:PulseAudio daemon,,,:/run/pulse:/usr/sbin/nologin
cups-browsed:x:118:111:/nonexistent:/usr/sbin/nologin
xrdp:x:119:124:/run/xrdp:/usr/sbin/nologin
tom:x:1001:1001:Zuha_Irfan,1,03435902786,1212,xyz:/home/tom:/bin/bash

```

- task2_verify_group.png

```

root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:syslog,zuha
tty:x:5:
disk:x:6:
lp:x:7:
mail:x:8:
news:x:9:
uucp:x:10:
man:x:12:
proxy:x:13:
kmem:x:15:
dialout:x:20:
fax:x:21:
voice:x:22:
cdrom:x:24:zuha
floppy:x:25:
tape:x:26:
sudo:x:27:zuha
audio:x:29:pulse
dip:x:30:zuha
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:zuha
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:zuha
messagebus:x:102:
systemd-resolve:x:992:
_ssh:x:103:
polkitd:x:991:
crontab:x:990:
syslog:x:104:
uidd:x:105:
rdma:x:106:
tcpdump:x:107:
tss:x:108:
landscape:x:109:
fwupd-refresh:x:989:
zuha:x:1000:
rtkit:x:110:
lpadmin:x:111:
netdev:x:112:
bluetooth:x:113:
ssl-cert:x:114:
lightdm:x:115:
nopasswdlogin:x:116:
whoopsie:x:117:
avahi:x:118:
scanner:x:119:saned
saned:x:120:
colord:x:121:
pulse:x:122:
pulse-access:x:123:
xrdp:x:124:
tom:x:1001:

```

- task2 verify shadow.png

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

- ```

1 #include <stdio.h>
2 #include <math.h>
3 #include <string.h>
4 #include <stdlib.h>
5 #include <time.h>
6 #include <unistd.h>
7 #include <sys/types.h>
8 #include <sys/stat.h>
9 #include <fcntl.h>
10 #include <sys/time.h>
11 #include <sys/mman.h>
12 #include <sys/wait.h>
13 #include <sys/resource.h>
14 #include <sys/param.h>
15 #include <sys/uio.h>
16 #include <sys/sysmacros.h>
17 #include <sys/unistd.h>
18 #include <sys/ioctl.h>
19 #include <sys/mount.h>
20 #include <sys/procfs.h>
21 #include <sys/sem.h>
22 #include <sys/shm.h>
23 #include <sys/msg.h>
24 #include <sys/socket.h>
25 #include <sys/un.h>
26 #include <sys/rpc.h>
27 #include <sys/queue.h>
28 #include <sys/limits.h>
29 #include <sys/errno.h>
30 #include <sys/signal.h>
31 #include <sys/proc.h>
32 #include <sys/procfs.h>
33 #include <sys/procfs.h>
34 #include <sys/procfs.h>
35 #include <sys/procfs.h>
36 #include <sys/procfs.h>
37 #include <sys/procfs.h>
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54 #include <sys/procfs.h>
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63 #include <sys/procfs.h>
64 #include <sys/procfs.h>
65 #include <sys/procfs.h>
66 #include <sys/procfs.h>
67 #include <sys/procfs.h>
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72 #include <sys/procfs.h>
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74 #include <sys/procfs.h>
75 #include <sys/procfs.h>
76 #include <sys/procfs.h>
77 #include <sys/procfs.h>
78 #include <sys/procfs.h>
79 #include <sys/procfs.h>
80 #include <sys/procfs.h>
81 #include <sys/procfs.h>
82 #include <sys/procfs.h>
83 #include <sys/procfs.h>
84 #include <sys/procfs.h>
85 #include <sys/procfs.h>
86 #include <sys/procfs.h>
87 #include <sys/procfs.h>
88 #include <sys/procfs.h>
89 #include <sys/procfs.h>
90 #include <sys/procfs.h>
91 #include <sys/procfs.h>
92 #include <sys/procfs.h>
93 #include <sys/procfs.h>
94 #include <sys/procfs.h>
95 #include <sys/procfs.h>
96 #include <sys/procfs.h>
97 #include <sys/procfs.h>
98 #include <sys/procfs.h>
99 #include <sys/procfs.h>
100 #include <sys/procfs.h>

```

- ```
designer.X.1004:  
zuha@zuha:~/Lab5$ sudo usermod -g designer tom  
id tom  
uid=1001(tom) gid=1004(designer) groups=1004(designer),100(users)
```

- task3_add_secondary_groups.png

```
zuha@zuha:~/Lab5$ sudo usermod -aG developer,devops tom
id tom
groups tom
uid=1001(tom) gid=1004(designer) groups=1004(designer),100(users),1002(developer),1003(devops)
tom : designer users developer devops
```

- task3_reset_secondary_groups.png

```
zuha@zuha:~/Lab5$ sudo usermod -G tom tom
id tom
groups tom
uid=1001(tom) gid=1004(designer) groups=1004(designer),1001(tom)
tom : designer tom
```

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

- task4_add_users.png

```
NAME_REGEX in configuration.
zuha@zuha:~/Lab5$ sudo adduser jerry
info: Adding user `jerry' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group `jerry' (1006) ...
info: Adding new user `jerry' (1006) with group `jerry (1006)' ...
info: Creating home directory `/home/jerry' ...
info: Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for jerry
Enter the new value, or press ENTER for the default
  Full Name []: Jerry
   Room Number []: 1
   Work Phone []: 12324
   Home Phone []: 133
    Other []: dwd
Is the information correct? [Y/n] Y
info: Adding new user `jerry' to supplemental / extra groups `users' ...
info: Adding user `jerry' to group `users' ...
zuha@zuha:~/Lab5$ sudo useradd scooby
```

- task4_scooby_su_auth_failure.png

```
zuha@zuha:~$ su - scooby
Password:
su: Authentication failure
```

- task4_set_password_scooby.png

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

- task4_scooby_su_no_home.png

```
zuha@zuha:~$ su - scooby
Password:
su: warning: cannot change directory to /home/scooby: No such file or directory
$ exit
```

- task4_scooby_no_home.png

```
zuha@zuha:~$ 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:98:98: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
sshd:x:109:65534:/run/sshd:/usr/sbin/nologin
zuha:x:1000:1000:zuha:/home/zuha:/bin/bash
rtkit:x:110:110:RealtimeKit,,:/proc:/usr/sbin/nologin
dnsmasq:x:999:65534:dnsmasq:/var/lib/misc:/usr/sbin/nologin
cups-pk-helper:x:111:111:user for cups-pk-helper service,,:/nonexistent:/usr/sbin/nologin
lightdm:x:112:115:Light Display Manager:/var/lib/lightdm:/bin/false
whoopsie:x:113:117:/nonexistent:/bin/false
avahi:x:114:118:Avahi mDNS daemon,,:/run/avahi-daemon:/usr/sbin/nologin
saned:x:115:120:/var/lib/saned:/usr/sbin/nologin
colord:x:116:121:colord colour management daemon,,:/var/lib/colord:/usr/sbin/nologin
pulse:x:117:122:PulseAudio daemon,,:/run/pulse:/usr/sbin/nologin
cups-browsed:x:118:111:/nonexistent:/usr/sbin/nologin
xrdp:x:119:124:/run/xrdp:/usr/sbin/nologin
tom:x:1001:1004:Zuha_Irfan,1,03435902786,1212,xyz:/home/tom:/bin/bash
Scooby:x:1002:1005:/home/Scooby:/bin/sh
jerry:x:1006:1006:Jerry,1,12324,133,dwd:/home/jerry:/bin/bash
scooby:x:1007:1007:/home/scooby:/bin/sh
```

```
zuha@zuha:~$ ls -ld /home/scooby
ls: cannot access '/home/scooby': No such file or directory
```

- task4_scooby_create_home.png

```
zuha@zuha:~$ sudo mkdir -p /home/scooby
sudo chown Scooby:Scooby /home/scooby
sudo chmod 750 /home/scooby
ls -ld /home/scooby
drwxr-x--- 2 Scooby Scooby 4096 Nov  4 09:33 /home/scooby
```

- task4_scooby_login_success.png

```
-rw----- 1 zuha zuha 10180 Nov  4 07:07 .xsession-errors.old
zuha@zuha:~$ su - scooby
pwd
ls -la
Password:
su: warning: cannot change directory to /home/scooby: Permission denied
$ exit
```

- task4_verify_users.png

```

cat /etc/passwd
total 184
drwxr-xr-x 20 zuha zuha 4096 Nov  4 09:26 .
drwxr-xr-x  7 root root  4096 Nov  4 09:35 ..
-rw-rw-r--  1 zuha zuha   109 Oct 24 05:56 answer.md
-rw-rw-r--  1 zuha zuha   152 Oct 24 07:50 apt_update_vs_upgrade.md
-rw-r--r--  1 zuha zuha  4364 Nov  4 09:26 .bash_history
-rw-r--r--  1 zuha zuha   220 Mar 31 2024 .bash_logout
-rw-r--r--  1 zuha zuha  3771 Mar 31 2024 .bashrc
drwxr-xr-x  9 zuha zuha  4096 Nov  4 07:55 .cache
drwxr-xr-x  8 zuha zuha  4096 Oct 27 05:39 .config
drwxr-xr-x  2 zuha zuha  4096 Oct 27 05:37 Desktop
-rw-r--r--  1 zuha zuha    23 Oct 27 05:37 .dmrc
drwxr-xr-x  2 zuha zuha  4096 Oct 27 05:37 Documents
drwxr-xr-x  2 zuha zuha  4096 Oct 27 05:37 Downloads
drwxr-xr-x  3 zuha zuha  4096 Oct 27 05:37 .gnupg
-rw-r--r--  1 zuha zuha     0 Oct 27 05:37 .ICEauthority
drwxrwxr-x  3 zuha zuha  4096 Oct 24 06:03 lab4
drwxrwxr-x  2 zuha zuha  4096 Nov  4 08:42 Lab5
drwxrwxr-x  3 zuha zuha  4096 Oct 24 05:55 .local
drwxr-xr-x  2 zuha zuha  4096 Oct 27 05:37 Music
drwxr-xr-x  2 zuha zuha  4096 Oct 27 05:37 Pictures
-rw-r--r--  1 zuha zuha   807 Mar 31 2024 .profile
drwxr-xr-x  2 zuha zuha  4096 Oct 27 05:37 Public
drwxr-xr-x  3 zuha zuha  4096 Oct 24 07:59 snap
drwxr-xr-x  2 zuha zuha  4096 Oct 24 05:42 .ssh
-rw-r--r--  1 zuha zuha     0 Oct 24 10:09 .sudo_as_admin_successful
drwxr-xr-x  2 zuha zuha  4096 Oct 27 05:37 Templates
drwxrwxr-x  2 zuha zuha  4096 Oct 27 07:17 thinclient_drives
drwxr-xr-x  2 zuha zuha  4096 Oct 27 05:37 Videos
-rw-r--r--  1 zuha zuha  6199 Nov  4 09:26 .viminfo
drwxrwxr-x  2 zuha zuha  4096 Oct 24 08:23 .vscode
-rw-r--r--  1 zuha zuha    49 Nov  4 07:55 .Xauthority
-rw-r--r--  1 zuha zuha 18768 Nov  4 07:07 .xorgxrdp.10.log
-rw-r--r--  1 zuha zuha 18665 Oct 27 07:32 .xorgxrdp.10.log.old
-rw-rw-r--  1 zuha zuha    14 Oct 27 07:07 .xsession
-rw-r--r--  1 zuha zuha  1367 Nov  4 07:55 .xsession-errors
-rw-r--r--  1 zuha zuha 10180 Nov  4 07:07 .xsession-errors.old

```

- task4_shell_switching.png

```

zuha@zuha:~$ sudo usermod -s /bin/bash scooby
su - scooby
Password:
su: warning: cannot change directory to /home/scooby: Permission denied
-bash: /home/scooby/.bash_profile: Permission denied
scooby@zuha:/home/zuha$ exit
logout
-bash: /home/scooby/.bash_logout: Permission denied

```

- task4_add_groups.png

```

zuha@zuha:~$ sudo addgroup jolly
sudo groupadd anime
info: Selecting GID from range 1000 to 59999 ...
info: Adding group 'jolly' (GID 1008) ...
zuha@zuha:~$

```

- task4_verify_groups.png




```

#addgroup zulu --$ sudo delgroup jolly
sudo groupdel anime
cat /etc/group
info: Removing group 'jolly' ...
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:syslog,zulu
tty:x:5:
disk:x:6:
lp:x:7:
mail:x:8:
news:x:9:
uucp:x:10:
man:x:12:
proxy:x:13:
kmem:x:15:
dialout:x:20:
fax:x:21:
voice:x:22:
cdrom:x:24:zulu
floppy:x:25:
tape:x:26:
zudo:x:27:zulu
audio:x:29:pulse
dip:x:30:zulu
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:zulu
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:zulu
messagebus:x:102:
systemd-resolve:x:992:
_ssh:x:103:
polkitd:x:991:
cronstab:x:990:
syslog:x:104:
unidd:x:105:
rdma:x:106:
topdump:x:107:
tss:x:108:
landscape:x:109:
fwupd-refresh:x:989:
zulu:x:1000:
rtkit:x:110:
lpadmin:x:111:
network:x:112:
bluetooth:x:113:
x11-cert:x:114:
lightdm:x:115:
nsswdlogin:x:116:
nsswd:x:117:
avahi:x:118:
scanner:x:119:scaned
smbd:x:120:
colord:x:121:
pulse:x:122:
pulse-sockets:x:123:
nmap:x:124:
ton:x:1001:ton
developer:x:1002:
devops:x:1003:
designer:x:1004:
scotty:x:1005:
jerry:x:1006:
scotty:x:1007:

```

```

scooby:x:1007:
zuha@zuha:~$ sudo deluser --remove-home Jerry
sudo userdel -r Scooby
cat /etc/passwd
fatal: The user 'Jerry' does not exist.
userdel: Scooby mail spool (/var/mail/Scooby) not found
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
sshd:x:109:65534:./run/ssh:/usr/sbin/nologin
zuha:x:1000:1000:zuha:/home/zuha:/bin/bash
rtkit:x:110:110:RealtimeKit,,./proc:/usr/sbin/nologin
dnsmasq:x:999:65534:dnsmasq:/var/lib/misc:/usr/sbin/nologin
cups-pk-helper:x:111:111:user for cups-pk-helper service,,./nonexistent:/usr/sbin/nologin
lightdm:x:112:115:Light Display Manager:/var/lib/lightdm:/bin/false
whoopsie:x:113:117:./nonexistent:/bin/false
avahi:x:114:118:Avahi mDNS daemon,,./run/avahi-daemon:/usr/sbin/nologin
saned:x:115:120:./var/lib/saned:/usr/sbin/nologin
colord:x:116:121:colord colour management daemon,,./var/lib/colord:/usr/sbin/nologin
pulse:x:117:122:PulseAudio daemon,,./run/pulse:/usr/sbin/nologin
cups-browsed:x:118:111:./nonexistent:/usr/sbin/nologin
xrdp:x:119:124:./run/xrdp:/usr/sbin/nologin
tom:x:1001:1004:Zuha_Irfan,1,03435902786,1212,xyz:/home/tom:/bin/bash
jerry:x:1006:1006:Jerry,1,12324,133,dwd:/home/jerry:/bin/bash
scooby:x:1007:1007:./home/scooby:/bin/bash

```

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

- task5_create_student.png

```

NAME_REGEX IN CONFIGURATION.
zuha@zuha:~$ 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 []: Zuha_Irfan
    Room Number []: 1
    Work Phone []: 1
    Home Phone []: 12
    Other []: sdsd
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

```
zuha@zuha:~$ su - student
touch file1
mkdir -p dir1
touch dir1/file2
ls -l
Password:
```

- task5_chown_file1.png

```
Password:
student@zuha:~$ sudo chown tom file1
ls -l file1
[sudo] password for student:
student is not in the sudoers file.
ls: cannot access 'file1': No such file or directory
student@zuha:~$ sudo chown Tom file1
```

- task5_chgrp_file1.png

```
ls: cannot access 'file1': No such file or directory
student@zuha:~$ sudo chgrp devops file1
ls -l file1
[sudo] password for student:
student is not in the sudoers file.
ls: cannot access 'file1': No such file or directory
```

- task5_file_types.png

```
student@zuha:~$ ls -l
ls -l dir1
ls -l /dev/null
file file1 dir1 /dev/null
total 0
ls: cannot access 'dir1': No such file or directory
crw-rw-rw- 1 root root 1, 3 Nov  4 07:12 /dev/null
file1:      cannot open 'file1' (No such file or directory)
dir1:      cannot open 'dir1' (No such file or directory)
/dev/null: character special (1/3)
```

- task5_exit_student.png

```

/dev/null: Character special (1/3)
student@zuha:~$ exit
logout
total 60
-rw-rw-r-- 1 zuha zuha 109 Oct 24 05:56 answer.md
-rw-rw-r-- 1 zuha zuha 152 Oct 24 07:50 apt_update_vs_upgrade.md
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Desktop
drwxrwxr-x 2 zuha zuha 4096 Nov  4 09:47 dir1
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Documents
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Downloads
-rw-rw-r-- 1 zuha zuha  0 Nov  4 09:47 file1
drwxrwxr-x 3 zuha zuha 4096 Oct 24 06:03 lab4
drwxrwxr-x 2 zuha zuha 4096 Nov  4 08:42 Lab5
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Music
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Pictures
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Public
drwx----- 3 zuha zuha 4096 Oct 24 07:59 snap
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Templates
drwxrwxr-t 2 zuha zuha 4096 Oct 27 07:17 thinclient_drives
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Videos

```

Task 6 – Change permissions using symbolic mode

- task6_su_student.png

```

zuha@zuha:~$ su - student
cd ~
ls -l file1
Password:

```

- task6_chmod_remove_rwx.png

```

student@zuha:~$ chmod -rwx file1
ls -l file1
chmod: cannot access 'file1': No such file or directory
ls: cannot access 'file1': No such file or directory

```

- task6_chmod_add_r.png

```

ls: cannot access 'file1': No such file or directory
student@zuha:~$ chmod +r file1
ls -l file1
chmod: cannot access 'file1': No such file or directory
ls: cannot access 'file1': No such file or directory

```

- task6_chmod_u_plus_x.png

```

student@zuha:~$ chmod u+x file1
ls -l file1
chmod: cannot access 'file1': No such file or directory
ls: cannot access 'file1': No such file or directory
student@zuha:~$ |

```

- task6_chmod_ug_plus_w.png

```
zuha@zuha:~$ chmod ug+w file1
zuha@zuha:~$ ls -l file1
-rw-rw-r-- 1 zuha zuha 0 Nov  4 09:47 file1
```

- task6_chmod_ugo_minus_rwx.png

```
zuha@zuha:~$ chmod ugo-rwx file1
zuha@zuha:~$ ls -l file1
----- 1 zuha zuha 0 Nov  4 09:47 file1
```

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

- task7_student_context.png

```
zuha@zuha:~$ su - student
Password:
student@zuha:~$ cd ~
student@zuha:~$ ls -l file1
ls: cannot access 'file1': No such file or directory
```

- task7_chmod_set_all_rwx.png

```
zuha@zuha:~$ chmod u=rwx,g=rwx,o=rwx file1
ls -l file1
-rwxrwxrwx 1 zuha zuha 0 Nov  4 09:47 file1
```

- task7_remove_exec_go.png

```
zuha@zuha:~$ chmod g=rw,o=rw file1
ls -l file1
-rwxrw-rw- 1 zuha zuha 0 Nov  4 09:47 file1
```

- task7_remove_all_perms.png

```
zuha@zuha:~$ chmod u=,g=,o= file1
ls -l file1
----- 1 zuha zuha 0 Nov  4 09:47 file1
```

Task 8 – Change permissions using numeric (octal) mode

```
student@zuha:~$ su - student
cd ~
ls -l file1
Password:
```

- task8_chmod_777.png

```
zuha@zuha:~$ chmod 777 file1
ls -l file1
-rwxrwxrwx 1 zuha zuha 0 Nov  4 09:47 file1
```

- task8_chmod_700.png

```
zuha@zuha:~$ chmod 700 file1
ls -l file1
-rwx----- 1 zuha zuha 0 Nov  4 09:47 file1
```

- task8_chmod_744.png

```
zuha@zuha:~$ chmod 744 file1
ls -l file1
-rwxr--r-- 1 zuha zuha 0 Nov  4 09:47 file1
```

- task8_chmod_640.png

```
zuha@zuha:~$ chmod 640 file1
ls -l file1
-rw-r----- 1 zuha zuha 0 Nov  4 09:47 file1
```

- task8_chmod_664.png

```
zuha@zuha:~$ chmod 664 file1
ls -l file1
-rw-rw-r-- 1 zuha zuha 0 Nov  4 09:47 file1
```

- task8_chmod_775.png

```
zuha@zuha:~$ chmod 775 file1
ls -l file1
-rwxrwxr-x 1 zuha zuha 0 Nov  4 09:47 file1
```

- task8_chmod_750.png

```
zuha@zuha:~$ chmod 750 file1
ls -l file1
-rwxr-x--- 1 zuha zuha 0 Nov  4 09:47 file1
```

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

- task9_grep_less.png

```
[sudo] password for student:
student is not in the sudoers file.
(END)
```

- task9_grep_more.png

```
student@zuha:~$ sudo cat /var/log/syslog | more
[sudo] password for student:
student is not in the sudoers file.
```

- task9_grep_head.png

```
student@zuha:~$ sudo grep -E 'fail|error' /var/log/syslog | head
[sudo] password for student:
student is not in the sudoers file.
```

- task9_redirect_overwrite.png

```
student@zuha:~$ sudo grep -i systemd /var/log/syslog > ~/syslog_systemd.txt
[sudo] password for student:
student is not in the sudoers file.
```

- task9_redirect_append.png

```
student is not in the sudoers file.
student@zuha:~$ sudo grep -i network /var/log/syslog >> ~/syslog_systemd.txt
cat ~/syslog_systemd.txt
[sudo] password for student:
student is not in the sudoers file.
```

- task9_journalctl_alternative.png

```
student@zuha:~$ sudo journalctl | less
sudo journalctl -u systemd | grep -i error > ~/journal_errors.txt
[sudo] password for student:
student is not in the sudoers file.
```

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

- task10_b1_vim.png

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

- task10_b1_run.png

```
zuha@zuha:~$ chmod +x setup.sh
zuha@zuha:~$ ./setup.sh
```

- task10_b2_vim.png

```
#Define and show var1
var1="Hello from Lab 06"
echo "var1:$var1"
```

- task10_b2_run.png

```
zuha@zuha:~$ ./setup.sh
var1: Hello from Lab 6
```

- task10_b3_vim.png

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

- task10_b3_run.png


```
zuha@zuha:~$ ./setup.sh
var1: Hello from Lab 6
allFiles (ls -l):
total 68
-rw-rw-r-- 1 zuha zuha 109 Oct 24 05:56 answer.md
-rw-rw-r-- 1 zuha zuha 152 Oct 24 07:50 apt_update_vs_upgrade.md
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Desktop
drwxrwxr-x 2 zuha zuha 4096 Nov  4 09:47 dir1
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Documents
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Downloads
-rwxr-x--- 1 zuha zuha  0 Nov  4 09:47 file1
drwxrwxr-x 3 zuha zuha 4096 Oct 24 06:03 lab4
drwxrwxr-x 2 zuha zuha 4096 Nov  4 08:42 Lab5
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Music
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Pictures
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Public
-rwxrwxr-x 1 zuha zuha 176 Nov  7 04:22 setup.sh
drwx----- 3 zuha zuha 4096 Oct 24 07:59 snap
-rw-rw-r-- 1 zuha zuha  27 Nov  6 10:45 sssetup.sh
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Templates
drwxrwxr-t 2 zuha zuha 4096 Oct 27 07:17 thinclient_drives
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Videos
```

- 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

```

zuha@zuha:~$ ./setup.sh
var1: Hello from Lab 6
allFiles (ls -l):
total 68
-rw-rw-r-- 1 zuha zuha 109 Oct 24 05:56 answer.md
-rw-rw-r-- 1 zuha zuha 152 Oct 24 07:50 apt_update_vs_upgrade.md
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Desktop
drwxrwxr-x 2 zuha zuha 4096 Nov  4 09:47 dir1
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Documents
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Downloads
-rwxr-x-- 1 zuha zuha  0 Nov  4 09:47 file1
drwxrwxr-x 3 zuha zuha 4096 Oct 24 06:03 lab4
drwxrwxr-x 2 zuha zuha 4096 Nov  4 08:42 Lab5
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Music
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Pictures
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Public
-rwxrwxr-x 1 zuha zuha 377 Nov  7 04:24 setup.sh
drwx----- 3 zuha zuha 4096 Oct 24 07:59 snap
-rw-rw-r-- 1 zuha zuha  27 Nov  6 10:45 sssetup.sh
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Templates
drwxrwxr-t 2 zuha zuha 4096 Oct 27 07:17 thinclient_drives
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Videos
Directory dir1 exists.
    else
        echo Directory dir1 does not exist. Creating...
        mkdir -p dir1
Directory dir1 created.

```

- 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

```

zuha@zuha:~$ ./setup.sh
var1: Hello from Lab 6
allFiles (ls -l):
total 68
-rw-rw-r-- 1 zuha zuha 109 Oct 24 05:56 answer.md
-rw-rw-r-- 1 zuha zuha 152 Oct 24 07:50 apt_update_vs_upgrade.md
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Desktop
drwxr-xr-x 2 zuha zuha 4096 Nov 4 09:47 dir1
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Documents
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Downloads
-rwxr-x--- 1 zuha zuha 0 Nov 4 09:47 file1
drwxr-xr-x 3 zuha zuha 4096 Oct 24 06:03 lab4
drwxr-xr-x 2 zuha zuha 4096 Nov 4 08:42 Lab5
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Music
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Pictures
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Public
-rwxr-xr-x 1 zuha zuha 588 Nov 7 04:30 setup.sh
drwx----- 3 zuha zuha 4096 Oct 24 07:59 snap
-rw-rw-r-- 1 zuha zuha 27 Nov 6 10:45 sssetup.sh
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Templates
drwxr-xr-t 2 zuha zuha 4096 Oct 27 07:17 thinclient_drives
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Videos
Directory dir1 exists.
else
    echo Directory dir1 does not exist. Creating...
    mkdir -p dir1
Directory dir1 created.
file2 already exists.
zuha@zuha:~$

```

- 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 "$f" ]; then
    echo "Execute permission missing; granting to user..."
    chmod u+x "$f"
fi
echo "Final permissions for $f:"
ls -l "$f"

```

- task10_b6_run.png

```

zuha@zuha:~$ ./setup.sh
var1: Hello from Lab 6
allFiles (ls -l):
total 68
-rw-rw-r-- 1 zuha zuha 109 Oct 24 05:56 answer.md
-rw-rw-r-- 1 zuha zuha 152 Oct 24 07:50 apt_update_vs_upgrade.md
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Desktop
drwxr-xr-x 2 zuha zuha 4096 Nov  4 09:47 dir1
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Documents
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Downloads
-rwxr-x--- 1 zuha zuha  0 Nov  4 09:47 file1
drwxr-xr-x 3 zuha zuha 4096 Oct 24 06:03 lab4
drwxr-xr-x 2 zuha zuha 4096 Nov  4 08:42 Lab5
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Music
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Pictures
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Public
-rwxr-xr-x 1 zuha zuha 1033 Nov  7 04:31 setup.sh
drwx----- 3 zuha zuha 4096 Oct 24 07:59 snap
-rw-rw-r-- 1 zuha zuha  27 Nov  6 10:45 sssetup.sh
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Templates
drwxr-xr-t 2 zuha zuha 4096 Oct 27 07:17 thinclient_drives
drwxr-xr-x 2 zuha zuha 4096 Oct 27 05:37 Videos
Directory dir1 exists.
else
    echo Directory dir1 does not exist. Creating...
    mkdir -p dir1
Directory dir1 created.
file2 already exists.
Final permissions for dir1/file2:
-rwxrw-r-- 1 zuha zuha 0 Nov  4 09:47 dir1/file2

```

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

```

zuha@zuha:~$ ./setup.sh
zuha@zuha:~$ chmod +x setup.sh
zuha@zuha:~$ ./setup.sh 10 Student

```

- task11_b1_vim.png

```
#!/bin/bash
num=$1
str=$2
if [ "$num" -eq 10 ]; then
    echo "$num is equal to 10 (-eq)."
```

- task11_b1_run.png

```
zuha@zuha:~$ ./setup.sh 10 Student
10 is equal to 10 (-eq).
zuha@zuha:~$ ./setup.sh 7 Student
7 is NOT equal to 10 (-eq).
```

- task11_b2_vim.png

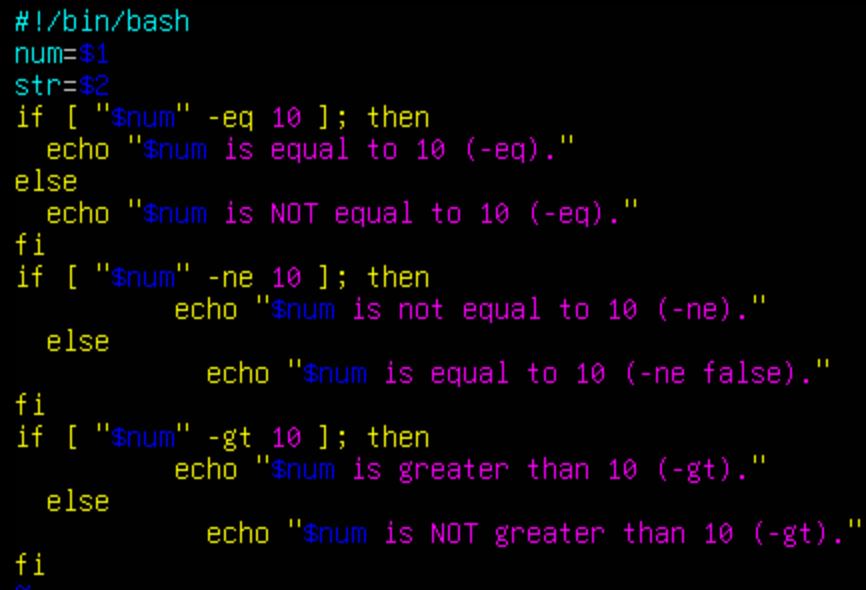
```
#!/bin/bash
num=$1
str=$2
if [ "$num" -eq 10 ]; then
    echo "$num is equal to 10 (-eq)."
```

- task11_b2_run.png

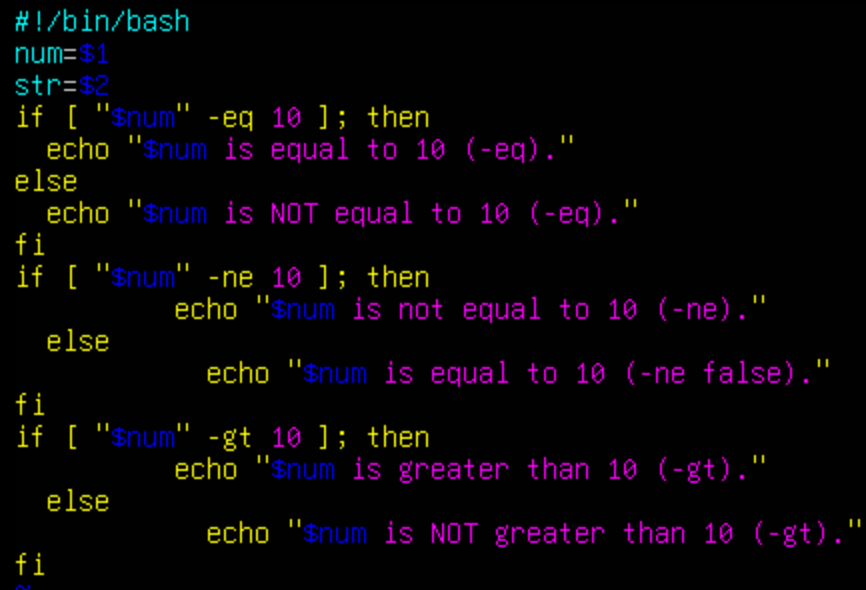
```
zuha@zuha:~$ ./setup.sh 10 Student
10 is equal to 10 (-eq).
10 is equal to 10 (-ne false).
zuha@zuha:~$ ./setup.sh 7 Student
7 is NOT equal to 10 (-eq).
7 is not equal to 10 (-ne).
```

- task11_b3_vim.png

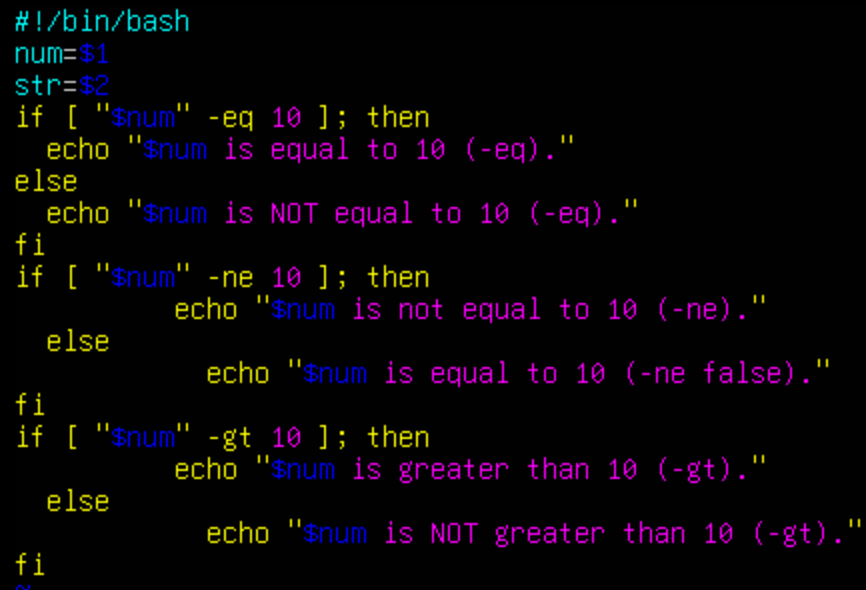
```
#!/bin/bash
num=$1
str=$2
if [ "$num" -eq 10 ]; then
    echo "$num is equal to 10 (-eq)."
```



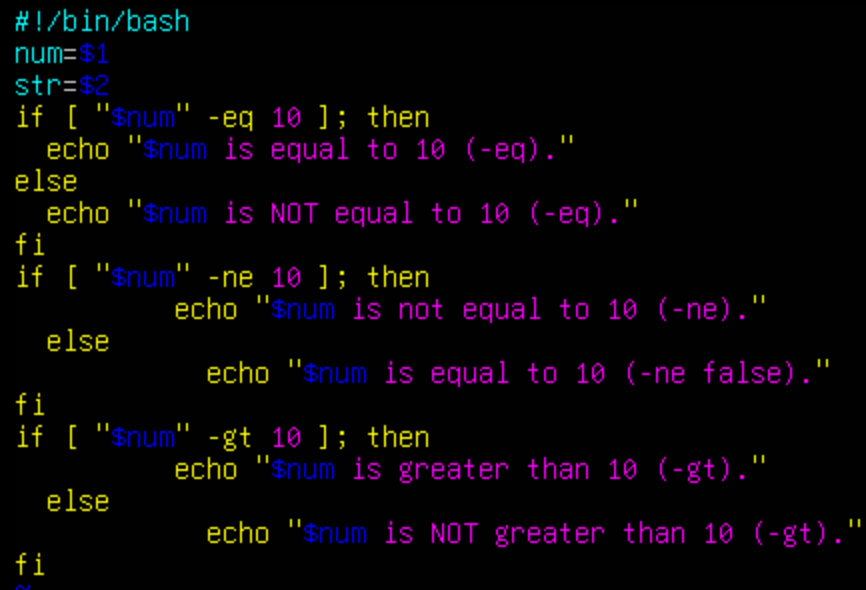
```
else
    echo "$num is NOT equal to 10 (-eq)."
```



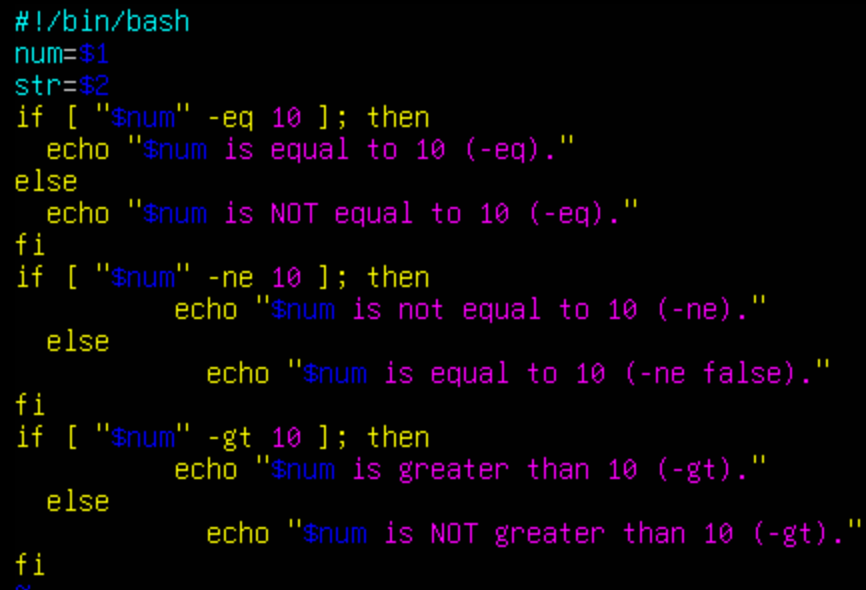
```
fi
if [ "$num" -ne 10 ]; then
    echo "$num is not equal to 10 (-ne)."
```



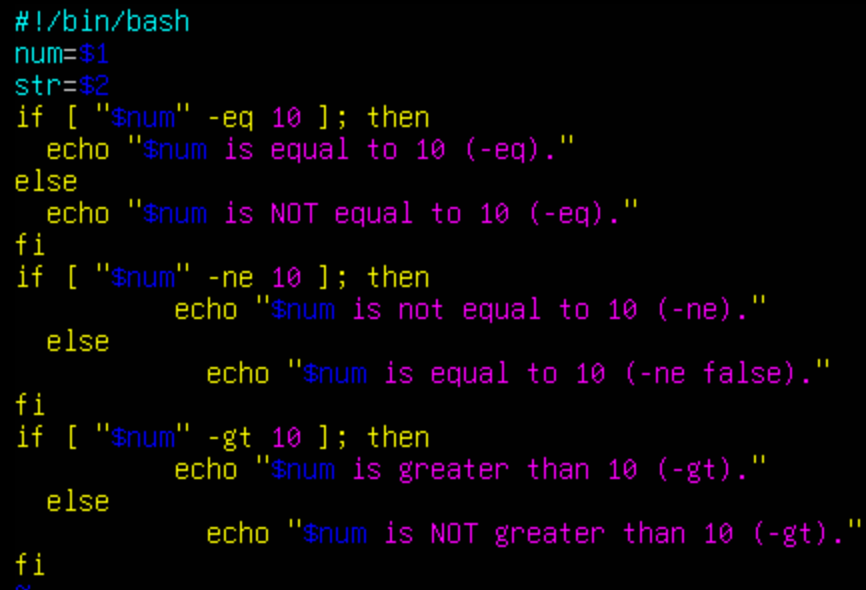
```
else
    echo "$num is equal to 10 (-ne false)."
```



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



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



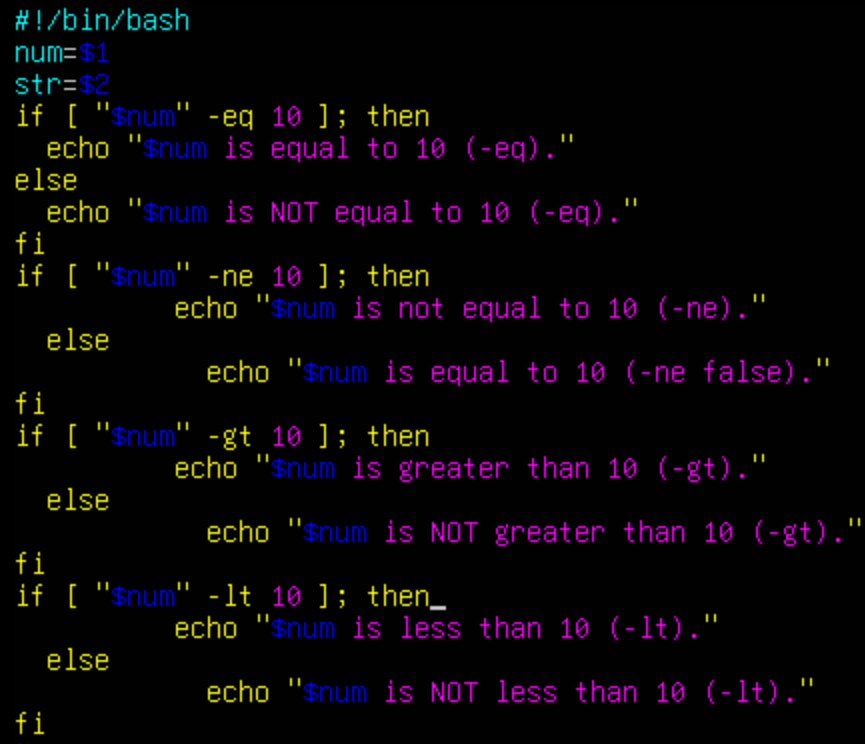
```
fi
~
```

- task11_b3_run.png

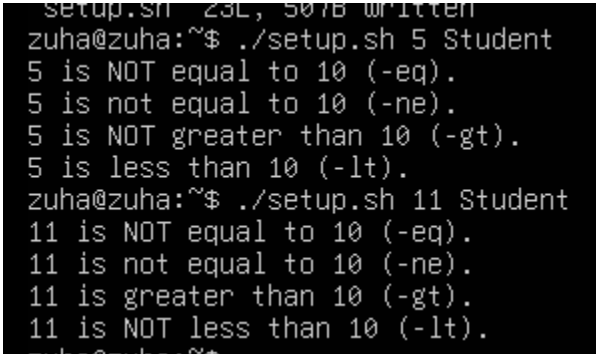
```
setup.sh 18L, 388B written
zuha@zuha:~$ ./setup.sh 12 Student
12 is NOT equal to 10 (-eq).
12 is not equal to 10 (-ne).
12 is greater than 10 (-gt).
zuha@zuha:~$ ./setup.sh 9 Student
9 is NOT equal to 10 (-eq).
9 is not equal to 10 (-ne).
9 is NOT greater than 10 (-gt).
```

- task11_b4_vim.png

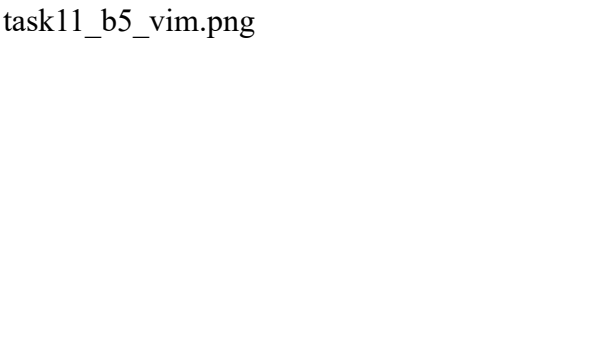
```
#!/bin/bash
num=$1
str=$2
if [ "$num" -eq 10 ]; then
    echo "$num is equal to 10 (-eq)."
```



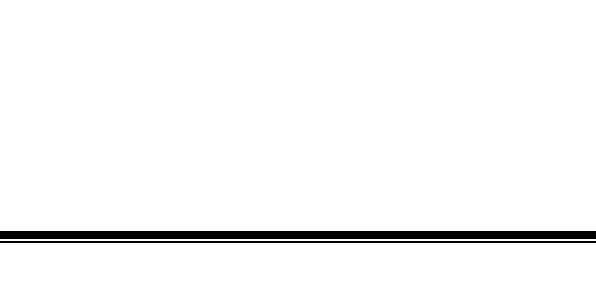
```
else
    echo "$num is NOT equal to 10 (-eq)."
```



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



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



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



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



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



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



```
fi
~
```

- task11_b4_run.png

```
Setup.sh 23L, 507B written
zuha@zuha:~$ ./setup.sh 5 Student
5 is NOT equal to 10 (-eq).
5 is not equal to 10 (-ne).
5 is NOT greater than 10 (-gt).
5 is less than 10 (-lt).
zuha@zuha:~$ ./setup.sh 11 Student
11 is NOT equal to 10 (-eq).
11 is not equal to 10 (-ne).
11 is greater than 10 (-gt).
11 is NOT less than 10 (-lt).
zuha@zuha:~$
```

- task11_b5_vim.png

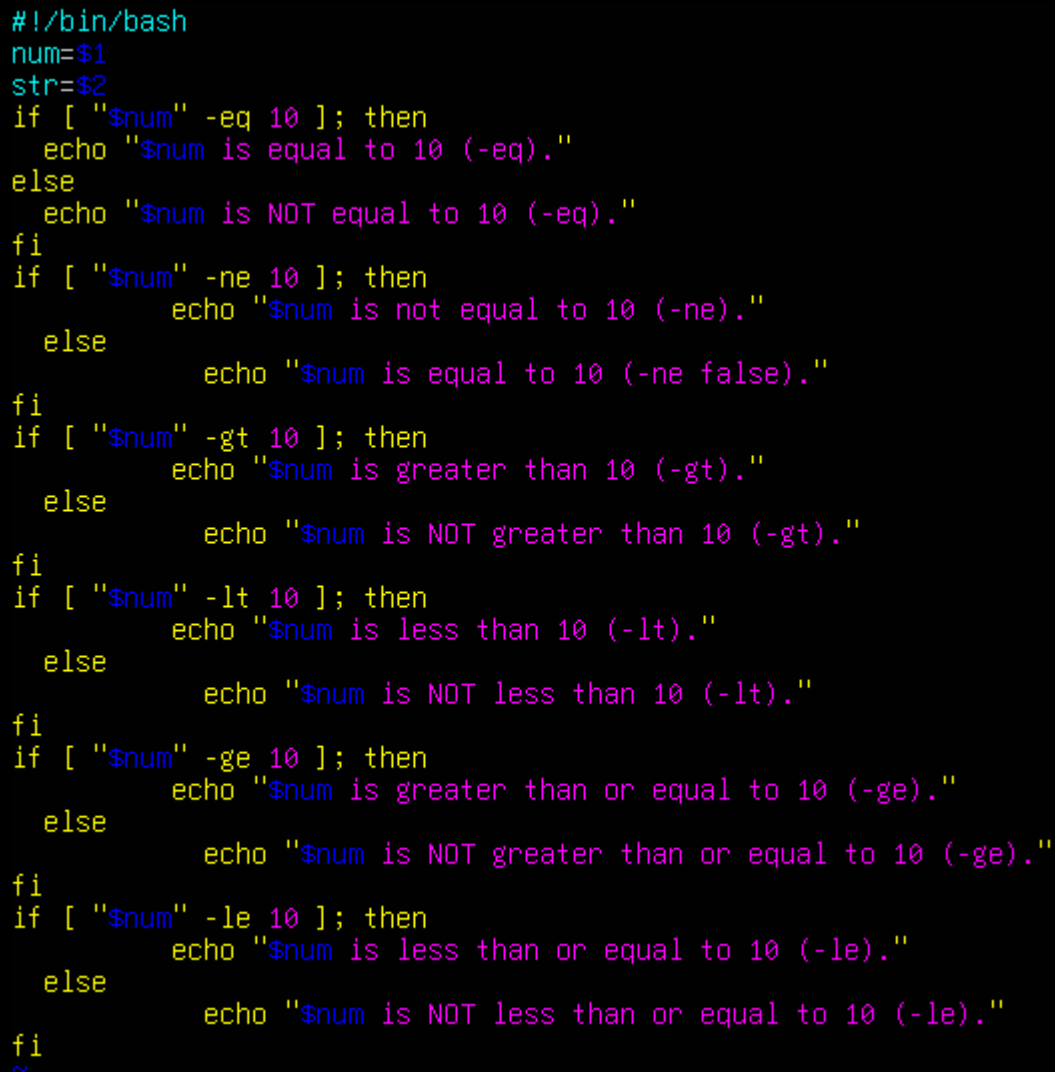
```
#!/bin/bash
num=$1
str=$2
if [ "$num" -eq 10 ]; then
    echo "$num is equal to 10 (-eq).\"
else
    echo \"$num is NOT equal to 10 (-eq).\"
fi
if [ \"$num\" -ne 10 ]; then
    echo \"$num is not equal to 10 (-ne).\"
else
    echo \"$num is equal to 10 (-ne false).\"
fi
if [ \"$num\" -gt 10 ]; then
    echo \"$num is greater than 10 (-gt).\"
else
    echo \"$num is NOT greater than 10 (-gt).\"
fi
if [ \"$num\" -lt 10 ]; then
    echo \"$num is less than 10 (-lt).\"
else
    echo \"$num is NOT less than 10 (-lt).\"
fi
if [ \"$num\" -ge 10 ]; then
    echo \"$num is greater than or equal to 10 (-ge).\"
else
    echo \"$num is NOT greater than or equal to 10 (-ge).\"
fi
```

- task11_b5_run.png

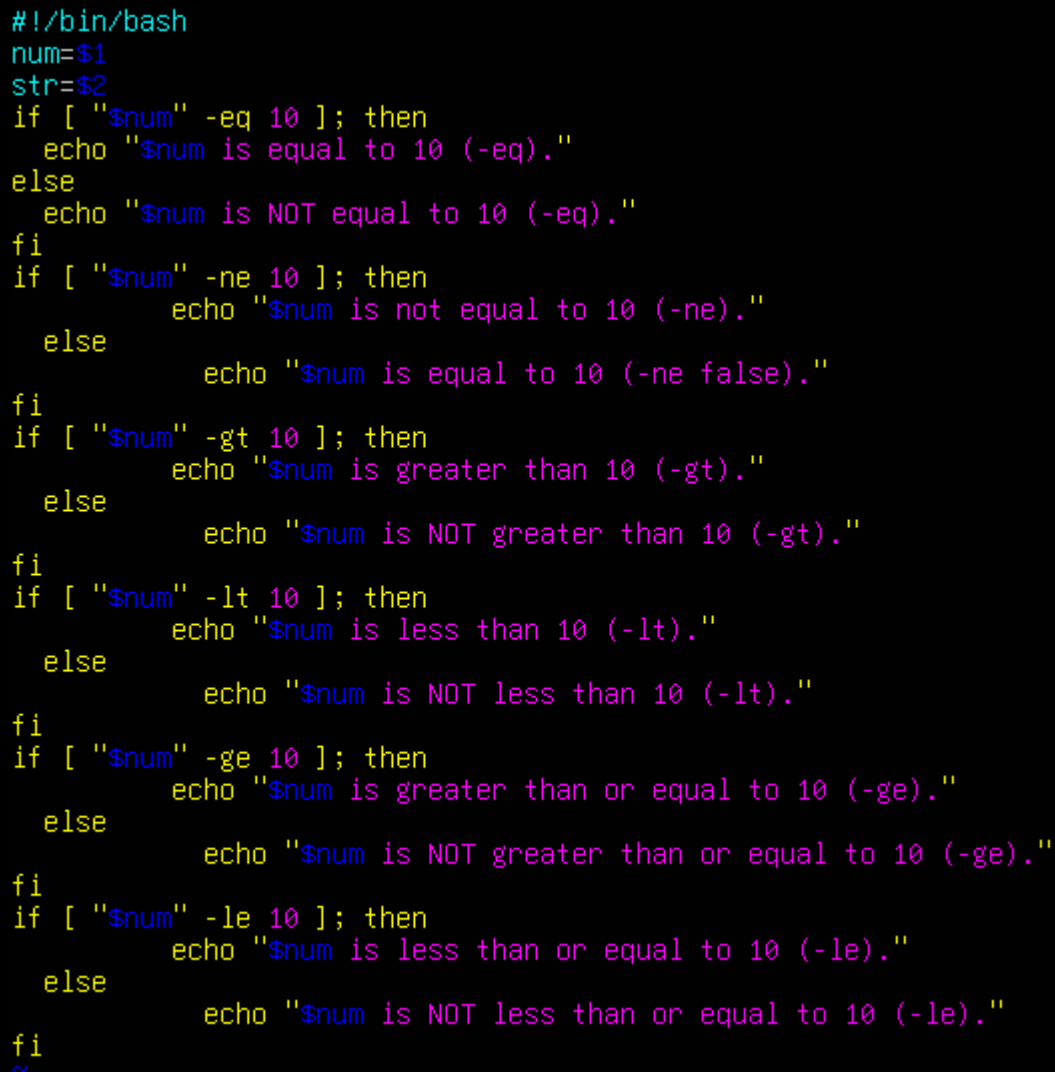
```
zuha@zuha:~$ ./setup.sh 10 Student
10 is equal to 10 (-eq).
10 is equal to 10 (-ne false).
10 is NOT greater than 10 (-gt).
10 is NOT less than 10 (-lt).
10 is greater than or equal to 10 (-ge).
zuha@zuha:~$ ./setup.sh 8 Student
8 is NOT equal to 10 (-eq).
8 is not equal to 10 (-ne).
8 is NOT greater than 10 (-gt).
8 is less than 10 (-lt).
8 is NOT greater than or equal to 10 (-ge).
```

- task11_b6_vim.png

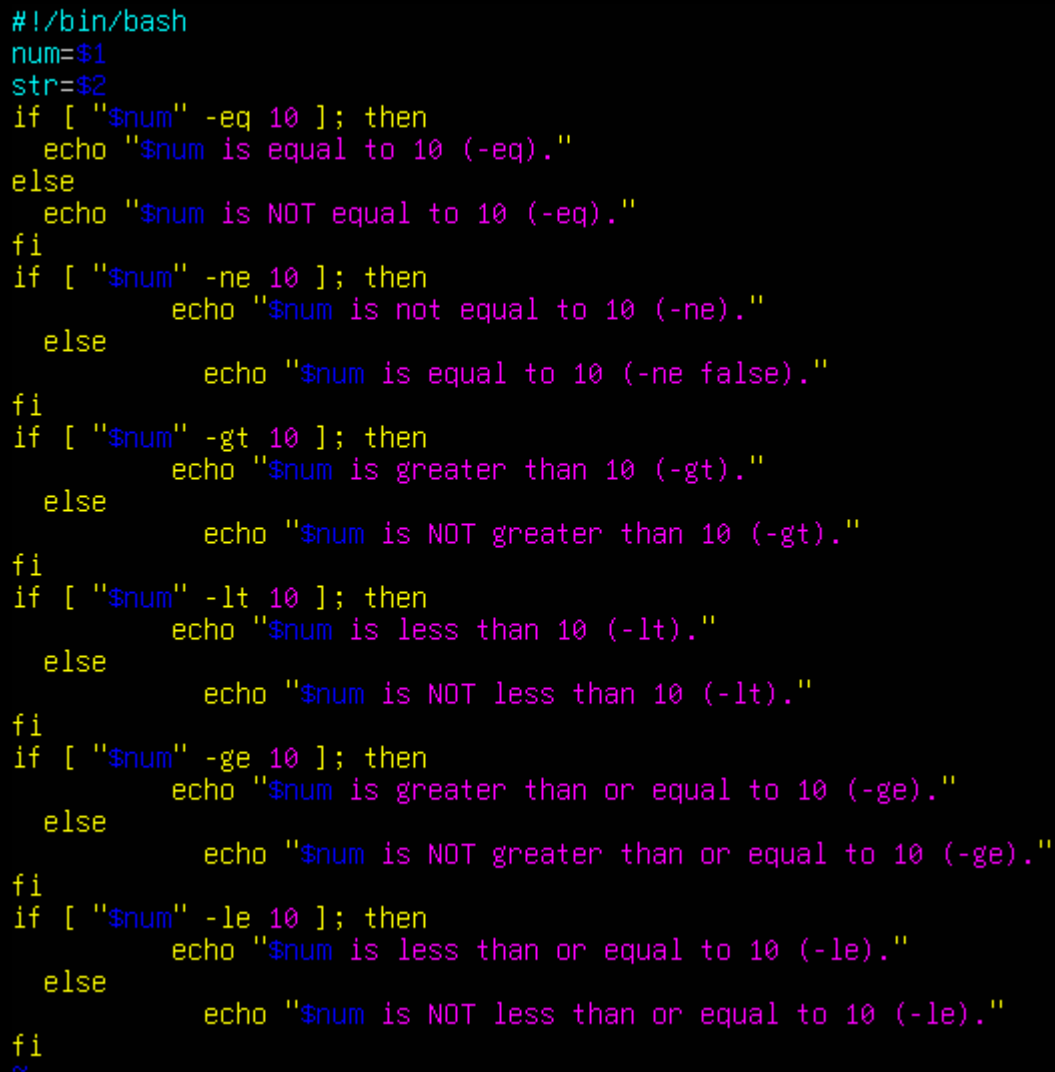

```
#!/bin/bash
num=$1
str=$2
if [ "$num" -eq 10 ]; then
    echo "$num is equal to 10 (-eq)."
```



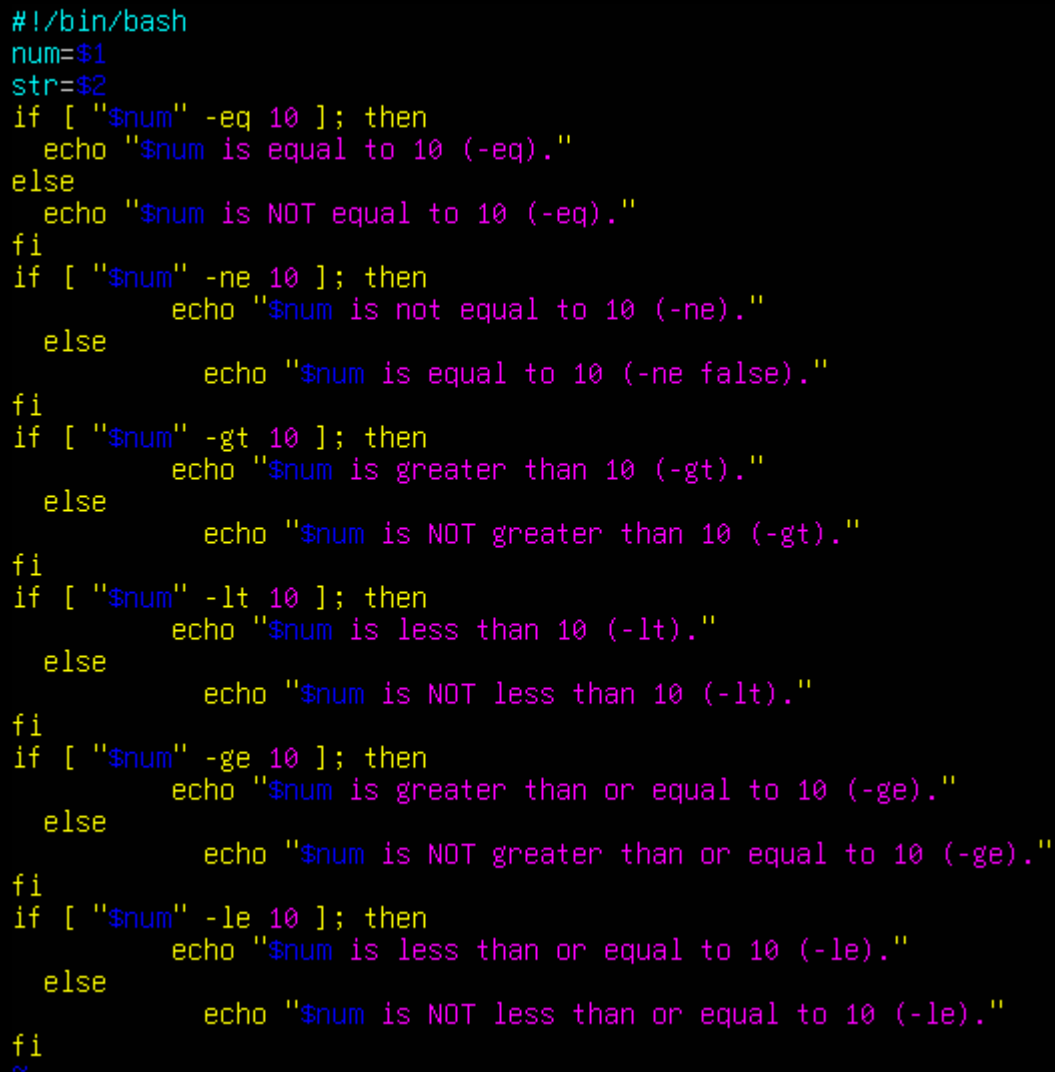
```
else
    echo "$num is NOT equal to 10 (-eq)."
```



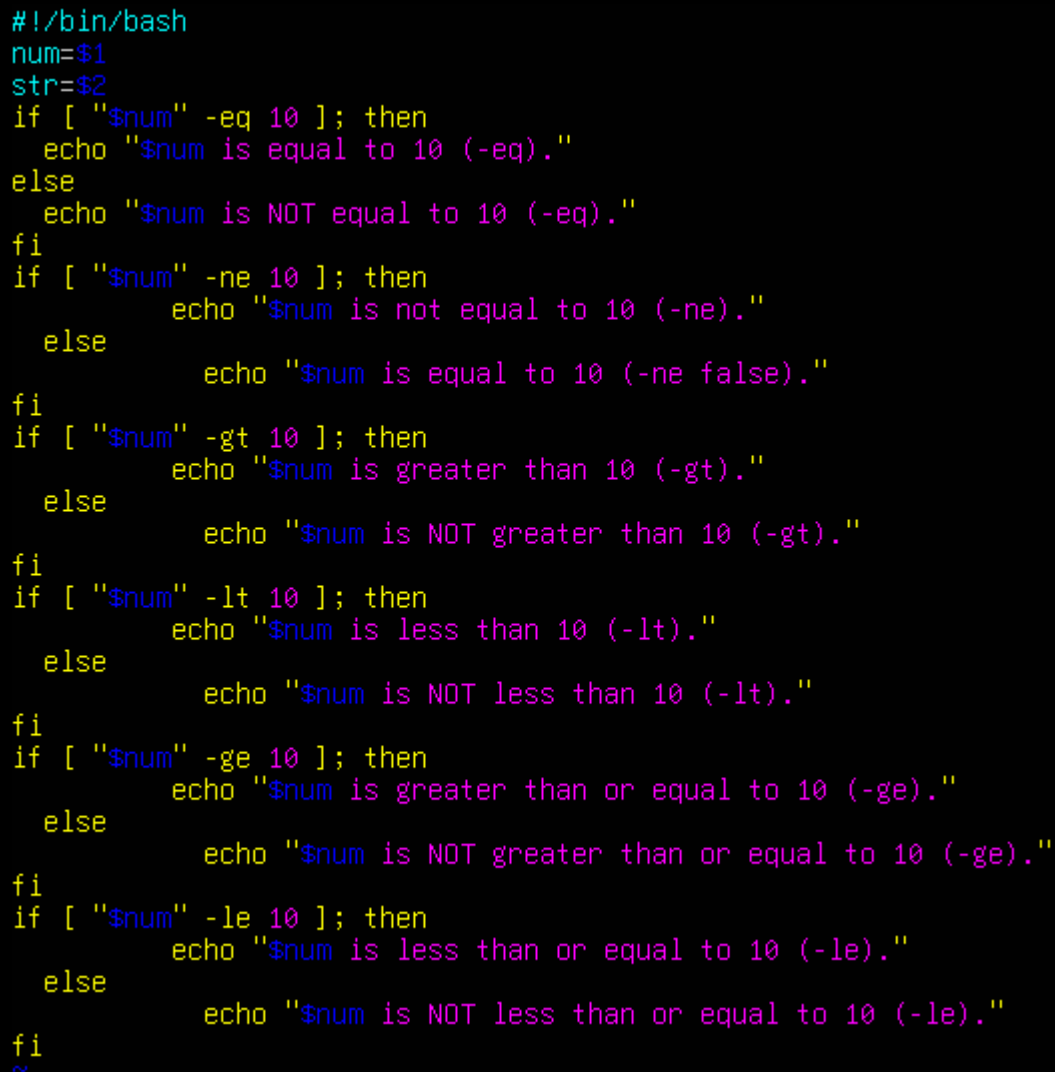
```
fi
if [ "$num" -ne 10 ]; then
    echo "$num is not equal to 10 (-ne)."
```



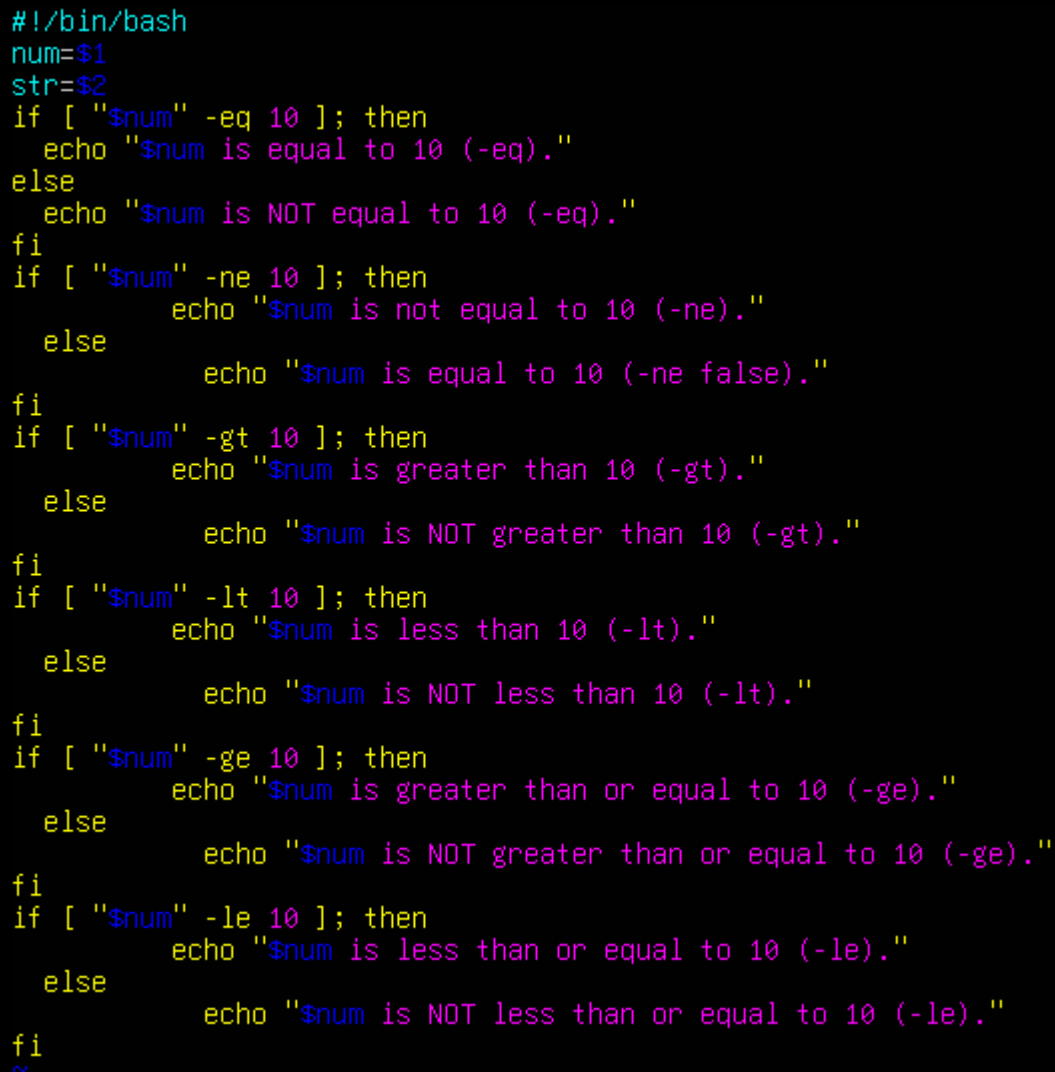
```
else
    echo "$num is equal to 10 (-ne false)."
```



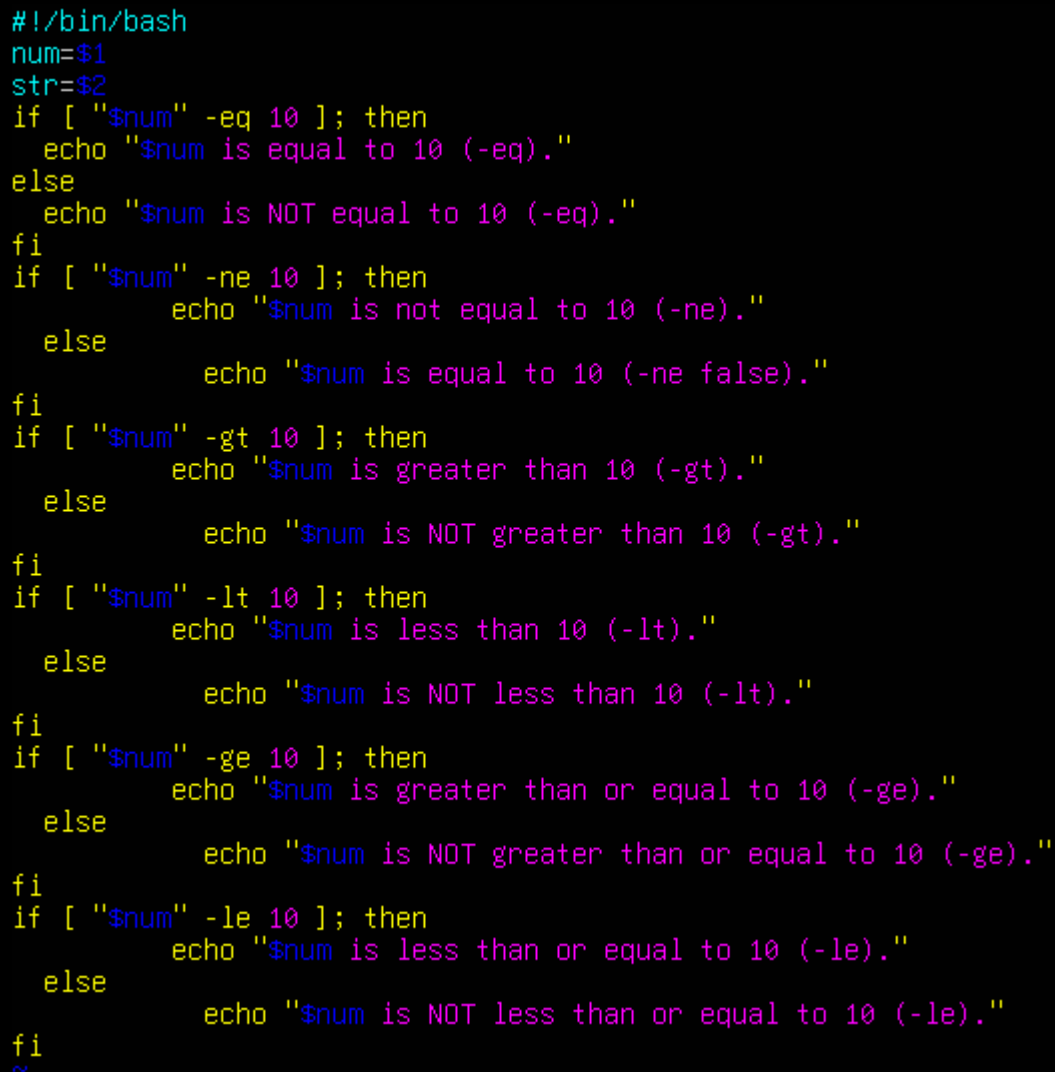
```
fi
if [ "$num" -gt 10 ]; then
    echo "$num is greater than 10 (-gt)."
```



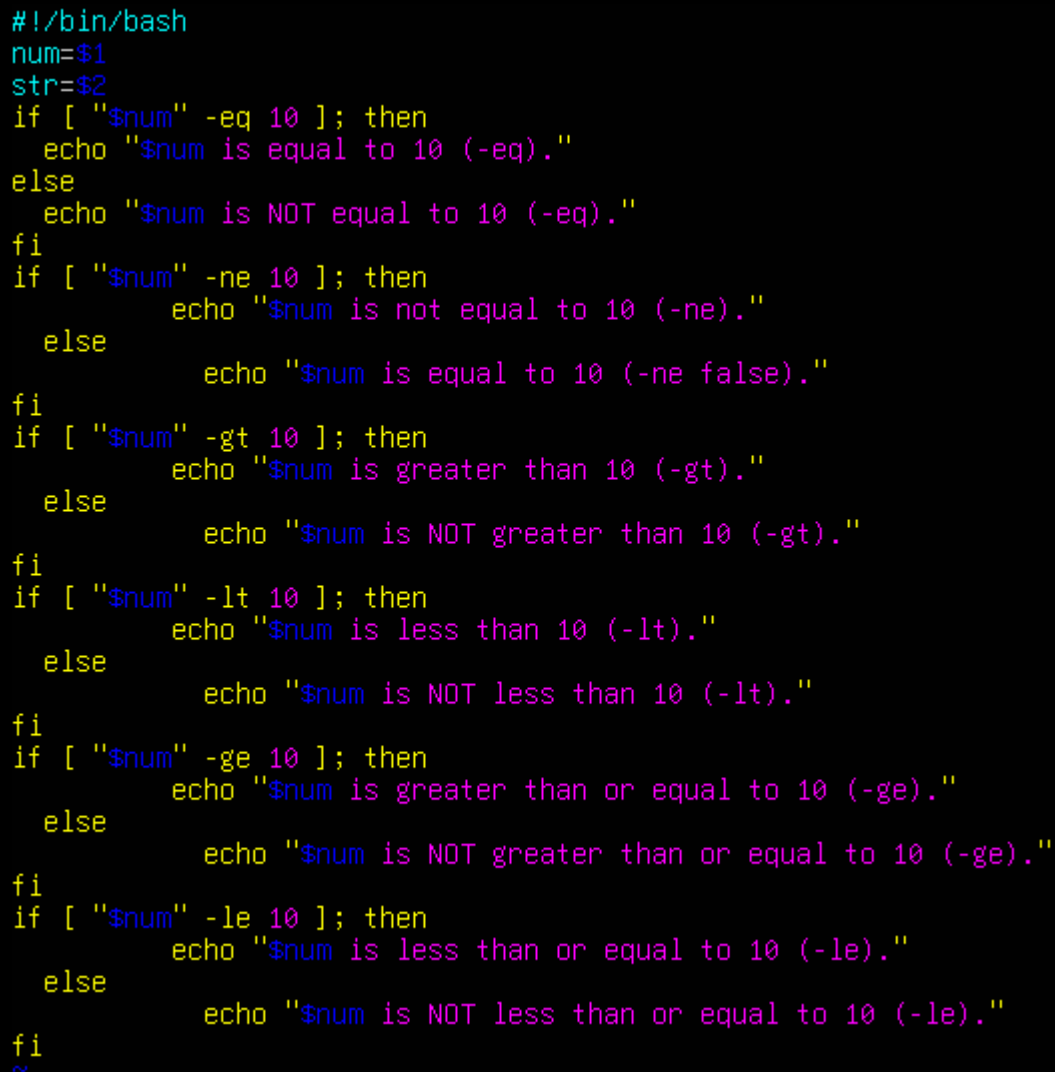
```
else
    echo "$num is NOT greater than 10 (-gt)."
```



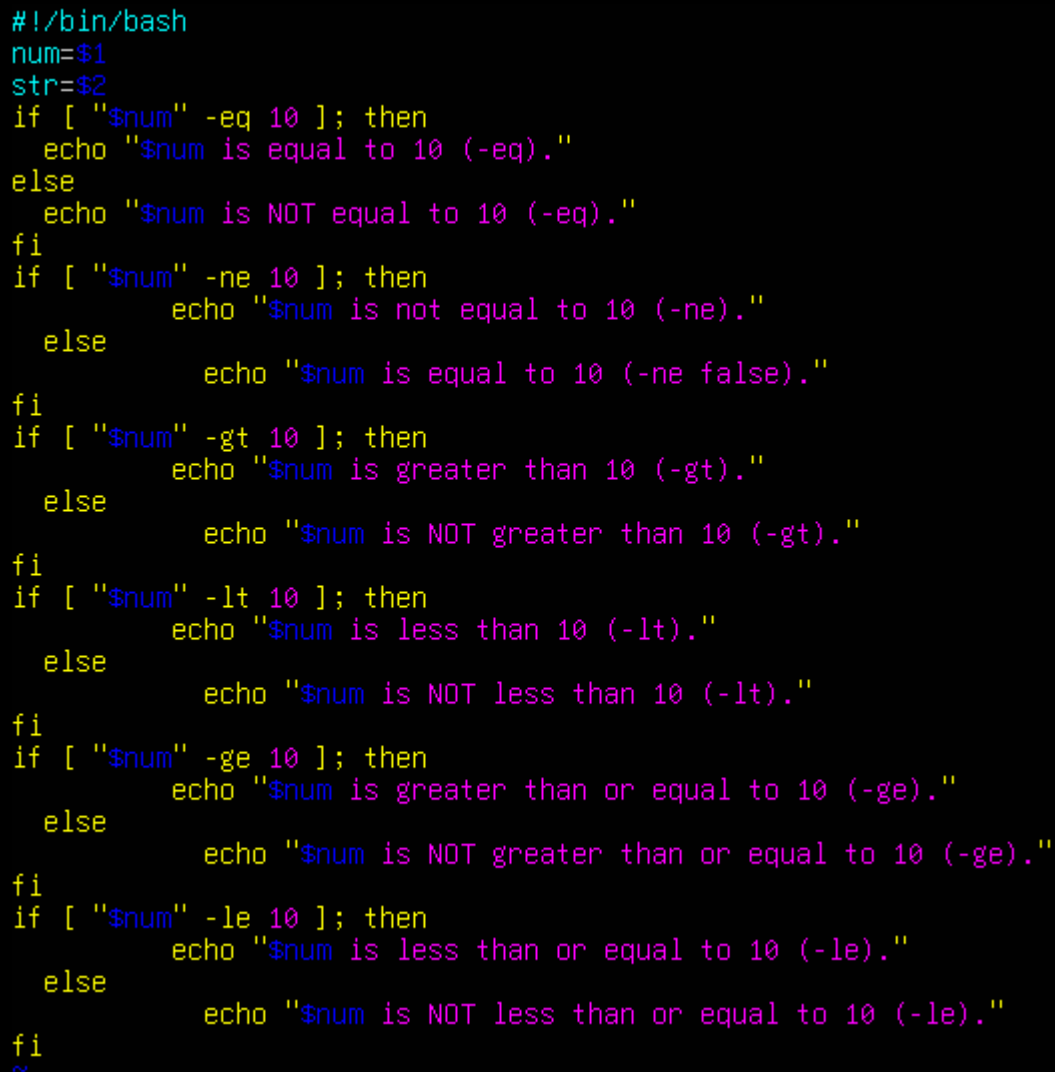
```
fi
if [ "$num" -lt 10 ]; then
    echo "$num is less than 10 (-lt)."
```



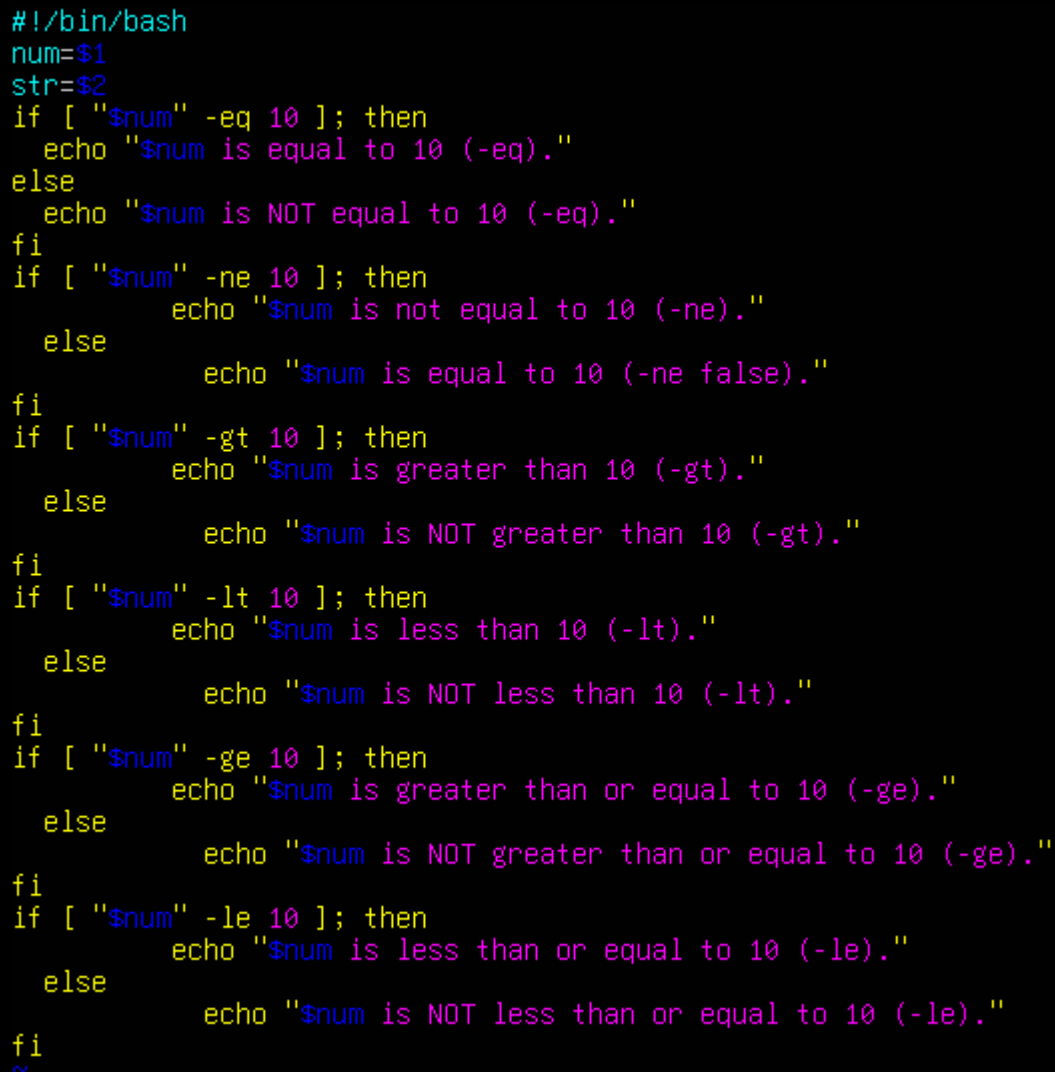
```
else
    echo "$num is NOT less than 10 (-lt)."
```



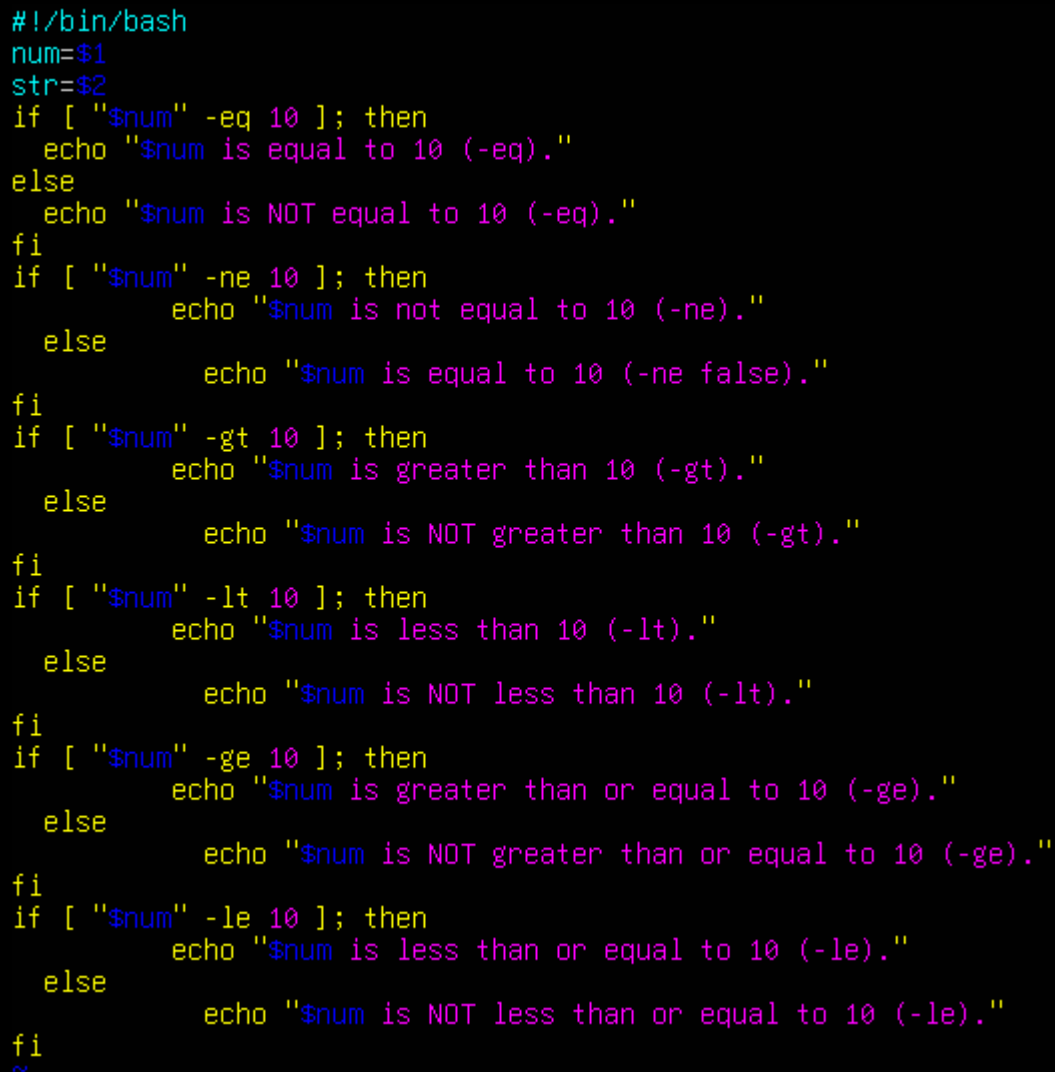
```
fi
if [ "$num" -ge 10 ]; then
    echo "$num is greater than or equal to 10 (-ge)."
```



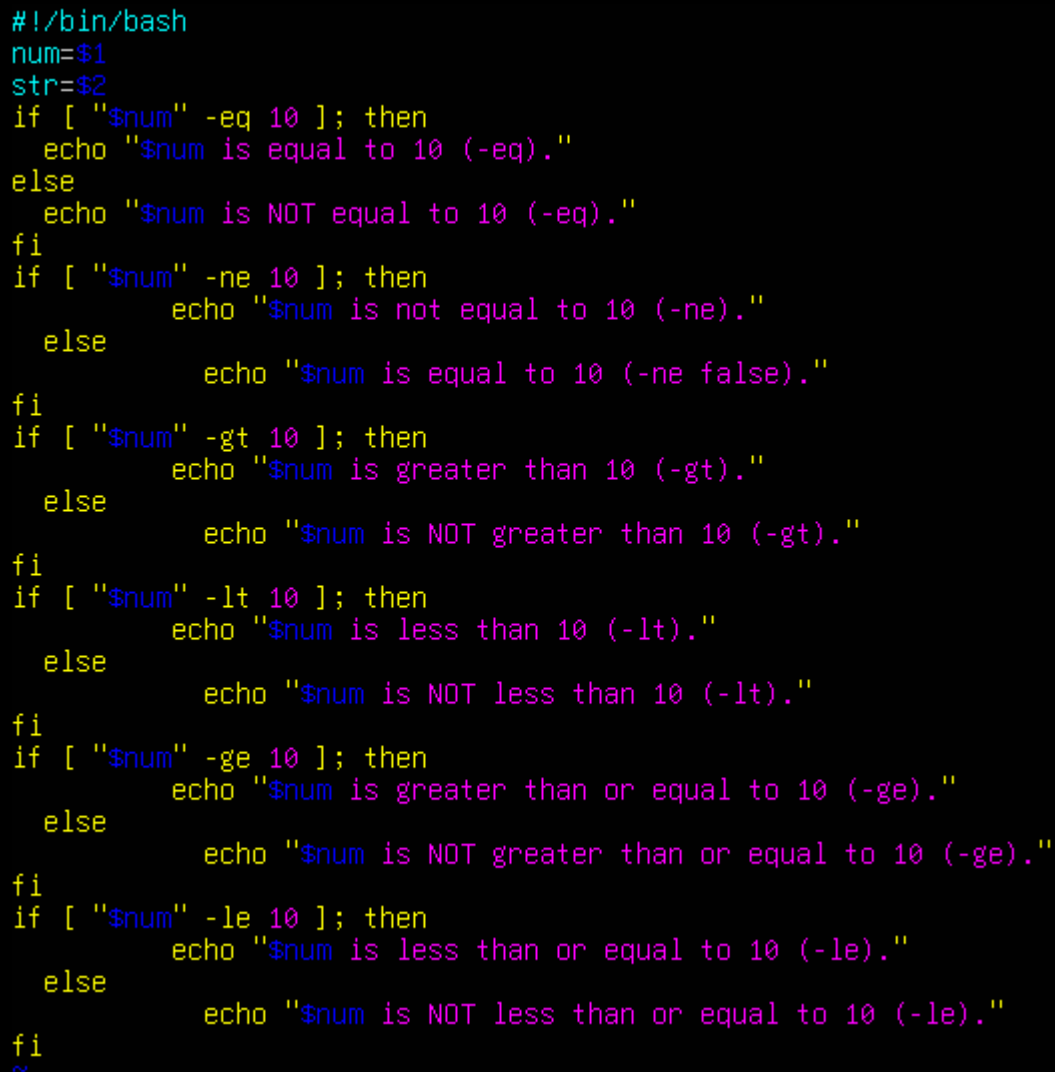
```
else
    echo "$num is NOT greater than or equal to 10 (-ge)."
```



```
fi
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

```
zuha@zuha:~$ ./setup.sh 10 Student
10 is equal to 10 (-eq).
10 is equal to 10 (-ne false).
10 is NOT greater than 10 (-gt).
10 is NOT less than 10 (-lt).
10 is greater than or equal to 10 (-ge).
10 is less than or equal to 10 (-le).
zuha@zuha:~$ ./setup.sh 12 Student
12 is NOT equal to 10 (-eq).
12 is not equal to 10 (-ne).
12 is greater than 10 (-gt).
12 is NOT less than 10 (-lt).
12 is greater than or equal to 10 (-ge).
12 is NOT less than or equal to 10 (-le).
zuha@zuha:~$
```

- task11_b7_vim.png

```
#!/bin/bash
num=$1
str=$2
if [ "$num" -eq 10 ]; then
    echo "$num is equal to 10 (-eq).\"
else
    echo \"$num is NOT equal to 10 (-eq).\"
fi
if [ \"$num\" -ne 10 ]; then
    echo \"$num is not equal to 10 (-ne).\"
else
    echo \"$num is equal to 10 (-ne false).\"
fi
if [ \"$num\" -gt 10 ]; then
    echo \"$num is greater than 10 (-gt).\"
else
    echo \"$num is NOT greater than 10 (-gt).\"
fi
if [ \"$num\" -lt 10 ]; then
    echo \"$num is less than 10 (-lt).\"
else
    echo \"$num is NOT less than 10 (-lt).\"
fi
if [ \"$num\" -ge 10 ]; then
    echo \"$num is greater than or equal to 10 (-ge).\"
else
    echo \"$num is NOT greater than or equal to 10 (-ge).\"
fi
if [ \"$num\" -le 10 ]; then
    echo \"$num is less than or equal to 10 (-le).\"
else
    echo \"$num is NOT less than or equal to 10 (-le).\"
fi
if [ \"$str\" = \"Student\" ]; then
    echo \"Second argument equals 'Student' ( = ).\"
else
    echo \"Second argument does NOT equal 'Student' ( = ).\"
fi
```

- task11_b7_run.png

```
setup.sh: 382, 391B written
zuha@zuha:~$ ./setup.sh 10 Student
10 is equal to 10 (-eq).
10 is equal to 10 (-ne false).
10 is NOT greater than 10 (-gt).
10 is NOT less than 10 (-lt).
10 is greater than or equal to 10 (-ge).
10 is less than or equal to 10 (-le).
Second argument equals 'Student' ( = ).
zuha@zuha:~$ ./setup.sh 10 Test
10 is equal to 10 (-eq).
10 is equal to 10 (-ne false).
10 is NOT greater than 10 (-gt).
10 is NOT less than 10 (-lt).
10 is greater than or equal to 10 (-ge).
10 is less than or equal to 10 (-le).
Second argument does NOT equal 'Student' ( = ).
zuha@zuha:~$
```

- task11_b8_vim.png

```

#!/bin/bash
num=$1
str=$2
if [ "$num" -eq 10 ]; then
    echo "$num is equal to 10 (-eq)."
```

```

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

```

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

```

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

```

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

```

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

```

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

```

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

```

fi
if [ "$num" -ge 10 ]; then
    echo "$num is greater than or equal to 10 (-ge)."
```

```

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

```

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

```

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

```

fi
if [ "$str" = "Student" ]; then
    echo "Second argument equals 'Student' ( = )."
```

```

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

```

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

```

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

```

fi

```

- task11_b8_run.png

```

zuha@zuha:~$ ./setup.sh 10 Test
10 is equal to 10 (-eq).
10 is equal to 10 (-ne false).
10 is NOT greater than 10 (-gt).
10 is NOT less than 10 (-lt).
10 is greater than or equal to 10 (-ge).
10 is less than or equal to 10 (-le).
Second argument does NOT equal 'Student' ( = ).
Second argument is not equal to 'Student' ( != ).
zuha@zuha:~$ ./setup.sh 10 Student
10 is equal to 10 (-eq).
10 is equal to 10 (-ne false).
10 is NOT greater than 10 (-gt).
10 is NOT less than 10 (-lt).
10 is greater than or equal to 10 (-ge).
10 is less than or equal to 10 (-le).
Second argument equals 'Student' ( = ).
Second argument equals 'Student' ( != false).

```

- task11_b9_vim.png

```

    echo "Second argument equals 'Student' ( != false)."
fi
if [ -z "$str" ]; then
    echo "Second argument is empty (zero-length)."
else
    echo "Second argument is not empty."
fi
~

```

- task11_b9_run.png

```

zuha@zuha:~$ ./setup.sh 10
10 is equal to 10 (-eq).
10 is equal to 10 (-ne false).
10 is NOT greater than 10 (-gt).
10 is NOT less than 10 (-lt).
10 is greater than or equal to 10 (-ge).
10 is less than or equal to 10 (-le).
Second argument does NOT equal 'Student' ( = ).
Second argument is not equal to 'Student' ( != ).
Second argument is empty (zero-length).
zuha@zuha:~$ ./setup.sh 10 Student
10 is equal to 10 (-eq).
10 is equal to 10 (-ne false).
10 is NOT greater than 10 (-gt).
10 is NOT less than 10 (-lt).
10 is greater than or equal to 10 (-ge).
10 is less than or equal to 10 (-le).
Second argument equals 'Student' ( = ).
Second argument equals 'Student' ( != false).
Second argument is not empty.

```

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: line 1: echo: write error
zuha@zuha:~$ ./setup.sh
zuha@zuha:~$
```

- task12_b2_vim.png

```
# Print all arguments using $*
echo "Printing all arguments using \${*}:"
for arg in $*; do
    echo "Argument: $arg"
done
```

- task12_b2_run.png

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

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

- task13_b1_vim.png

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

- task13_b1_run.png

```
zuha@zuha:~$ chmod +x setup.sh
zuha@zuha:~$ ./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

```
zuha@zuha:~$ ./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
```

- 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

```
zuha@zuha:~$ ./setup.sh
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
Final total: 7
Now calling sum_two function:
Enter a number (or 'q' to quit): q
Function final total: 0
```

- 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

```
zuha@zuha:~$ chmod +x setup.sh
zuha@zuha:~$ ./setup.sh
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
Final total: 7
Now calling sum_two function:
Enter a number (or 'q' to quit): q
Function final total: 0
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



Zuha-Irfan/UbuntuMachine

- task14_codespace_launch.png

Zuha-Irfan / UbuntuMachine

Code Pull requests Actions Projects Wiki Security Insights Settings

UbuntuMachine Public
forked from WaqasSaleem97/UbuntuMachine

main 1 Branch 0 Tags

Go to file t Add file <> Code

This branch is up to date with WaqasSaleem97/UbuntuMachine:main .

240438 Adding the stop script

| File | Commit |
|------------------|------------------------|
| README.md | Initial commit |
| start-desktop.sh | Adding the stop script |
| stop-desktop.sh | Adding the stop script |

README

Local **Codespaces**

Codespaces
Your workspaces in the cloud

On current branch

literate halibut ● Active

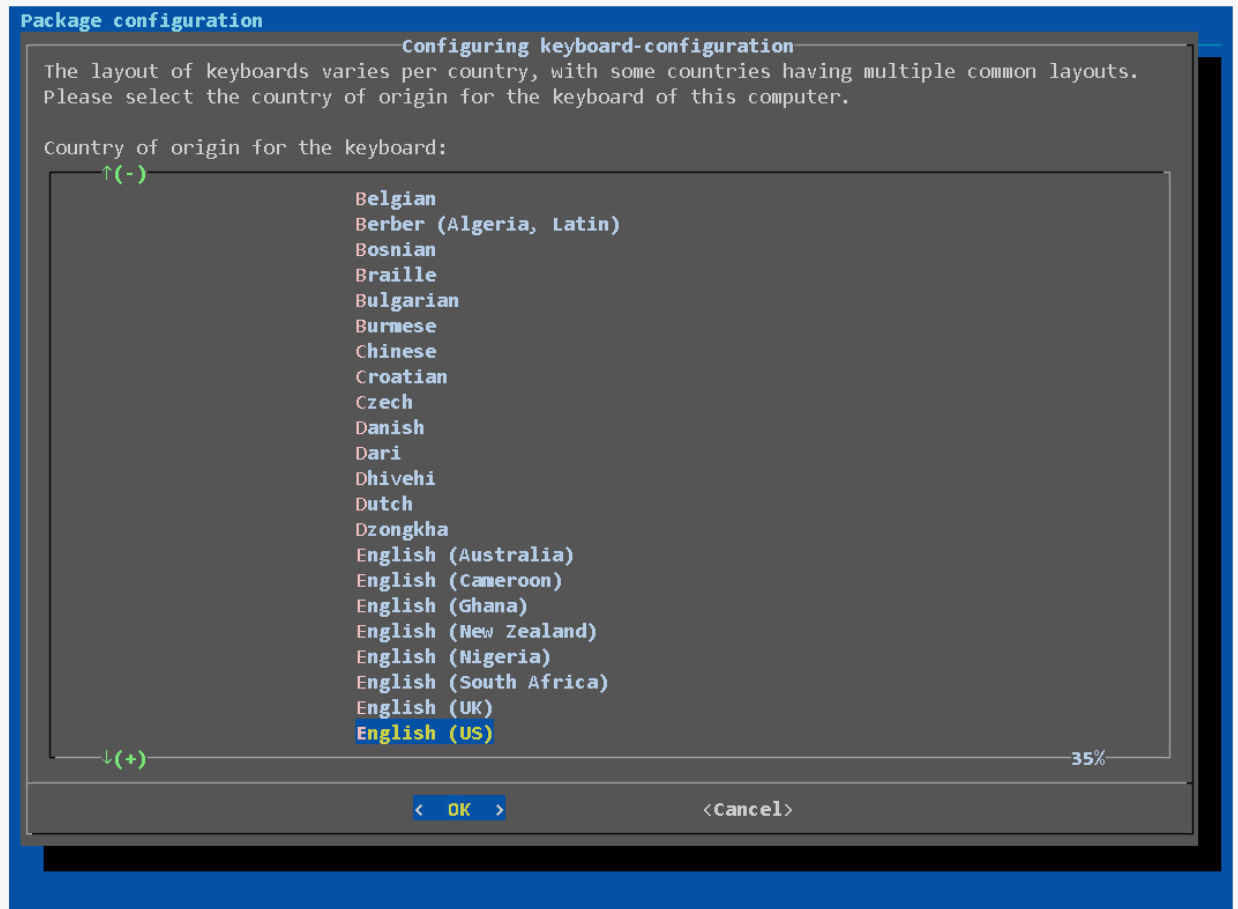
main No changes

Codespace usage for this repository is paid for by Zuha-Irfan.

- task14_start_script_ls.png

```
@Zuha-Irfan → /workspaces/UbuntuMachine (main) $ ls -l start-desktop.sh stop-desktop.sh
-rwxrwxrwx 1 codespace root 1333 Nov  7 05:30 start-desktop.sh
-rwxrwxrwx 1 codespace root  428 Nov  7 05:30 stop-desktop.sh
@Zuha-Irfan → /workspaces/UbuntuMachine (main) $ chmod +x start-desktop.sh stop-desktop.sh
@Zuha-Irfan → /workspaces/UbuntuMachine (main) $ ls -l
total 12
-rw-rw-rw- 1 codespace root  31 Nov  7 05:30 README.md
-rwxrwxrwx 1 codespace root 1333 Nov  7 05:30 start-desktop.sh
-rwxrwxrwx 1 codespace root  428 Nov  7 05:30 stop-desktop.sh
```

- task14_start_run.png



- task14_ports_view.png

| Port | Forwarded Address | Running Process | Visibility | Origin |
|----------|------------------------|---|------------|----------------|
| 5900 | https://crispy-guac... | x11vnc -display :1 -rfbauth /home/codesp... | Private | Auto Forwarded |
| 5901 | https://crispy-guac... | x11vnc -display :1 -rfbauth /home/codesp... | Private | Auto Forwarded |
| 6080 | https://crispy-guac... | /usr/bin/python3 /usr/bin/websocketify --w... | Public | Auto Forwarded |
| Add Port | | | | |

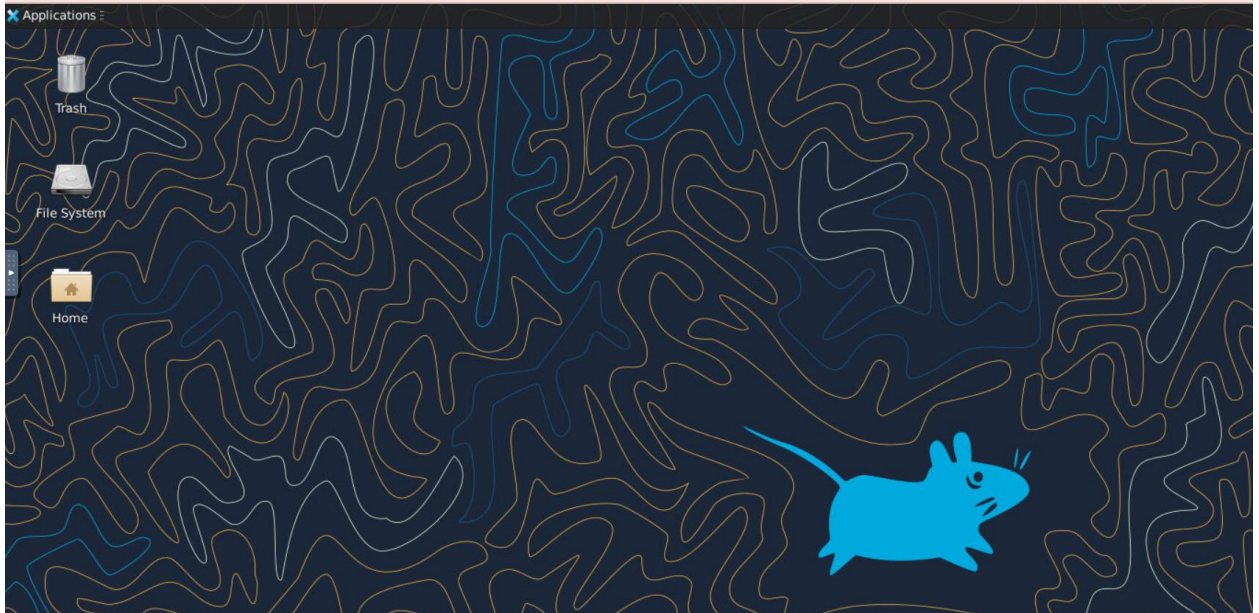
- task14_vnc_url.png

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

```
@Zuha-Irfan → /workspaces/UbuntuMachine (main) $ ./stop-desktop.sh
[*] Stopping noVNC server...
noVNC server not running.
[*] Stopping x11vnc server...
x11vnc server not running.
[*] Stopping XFCE desktop session...
XFCE4 session not running.
[*] Stopping virtual X server (Xvfb)...
Xvfb not running.
[✓] All services stopped
```

- task14_stop_run.png

