

MelvrickLee / BRG-28-ISEA- Code Issues Pull requests Actions Projects Security Insights ⚙️

main BRG-28-ISEA- / README.md ...

 MelvrickLee Update README.md d693736 · 5 minutes ago 🕒

828 lines (537 loc) · 23.5 KB

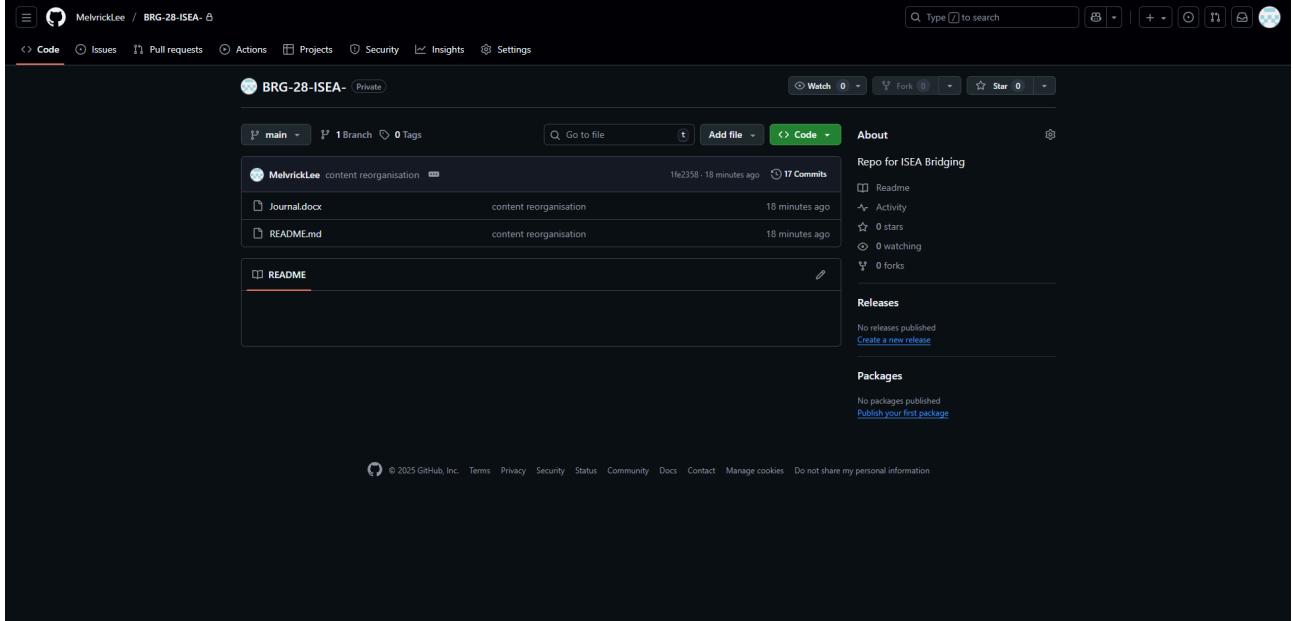
This document contains the screenshot and output of all lab activities

Session 1a - AM

```
#####
#####
```

Signup for GitHub Account:

Creating an account + repository:



The screenshot shows a GitHub repository named "BRG-28-ISEA-". The repository is private and has 1 branch and 0 tags. It contains three files: "content reorganisation", "Journal.docx", and "README.md". The "README.md" file was last updated 18 minutes ago. The repository details show it's for ISEA Bridging, with 0 stars, 0 forks, and 0 watching. There are no releases or packages published.

Since I had prior experience with GitHub, I had no trouble creating a repository

As Git was not covered, I used GitHub App to clone the repository onto my local machine

Name	Date modified	Type	Size
📁 .git	11/15/2025 12:32 PM	File folder	
📄 README_Backup.md	11/15/2025 11:40 AM	MD File	
WORD DOCUMENT Journal.docx	11/15/2025 11:47 AM	Microsoft Word D...	
📄 README.md	11/15/2025 12:32 PM	MD File	

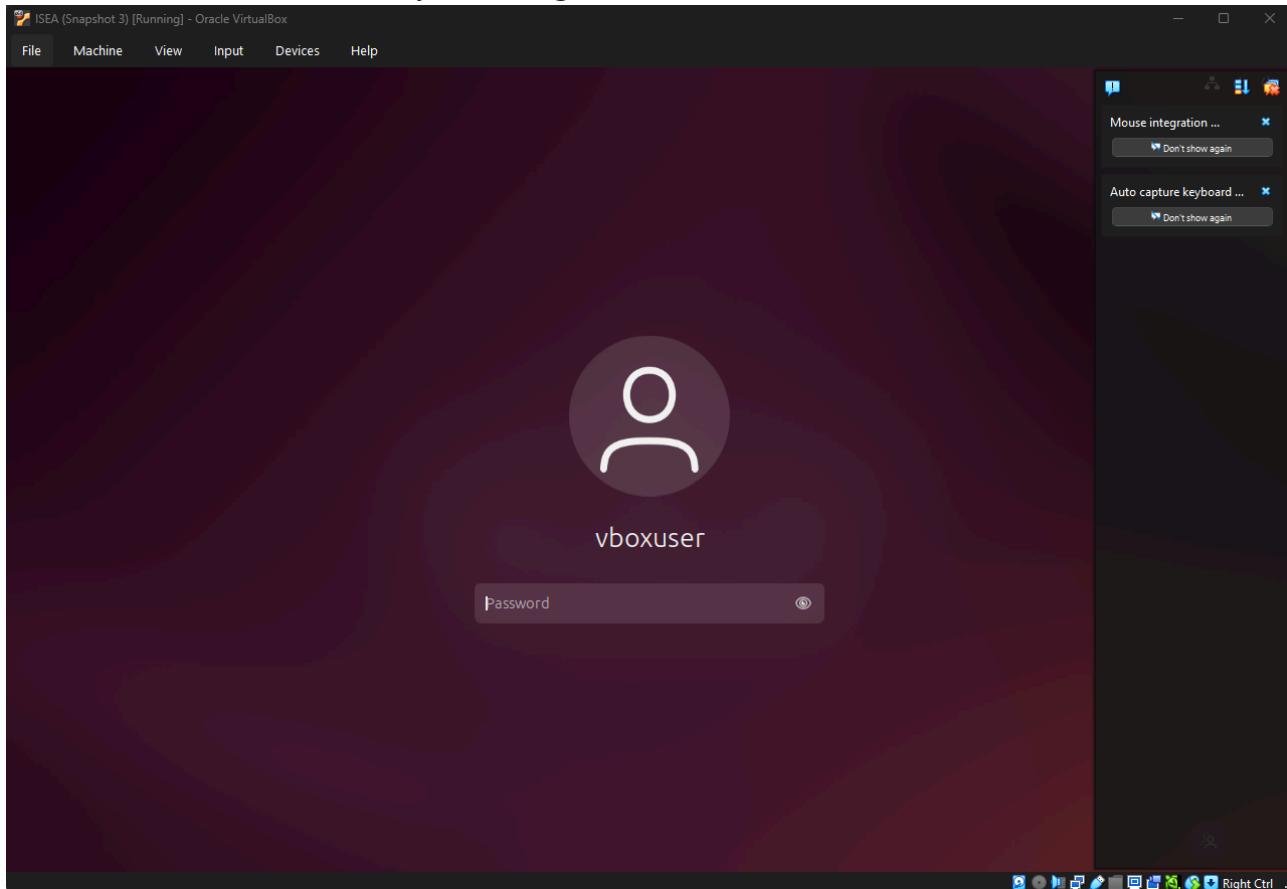
This screenshot shows the folder of the local repository in windows file explorer

*note that ReadmeBackup.md was added in between the screenshots

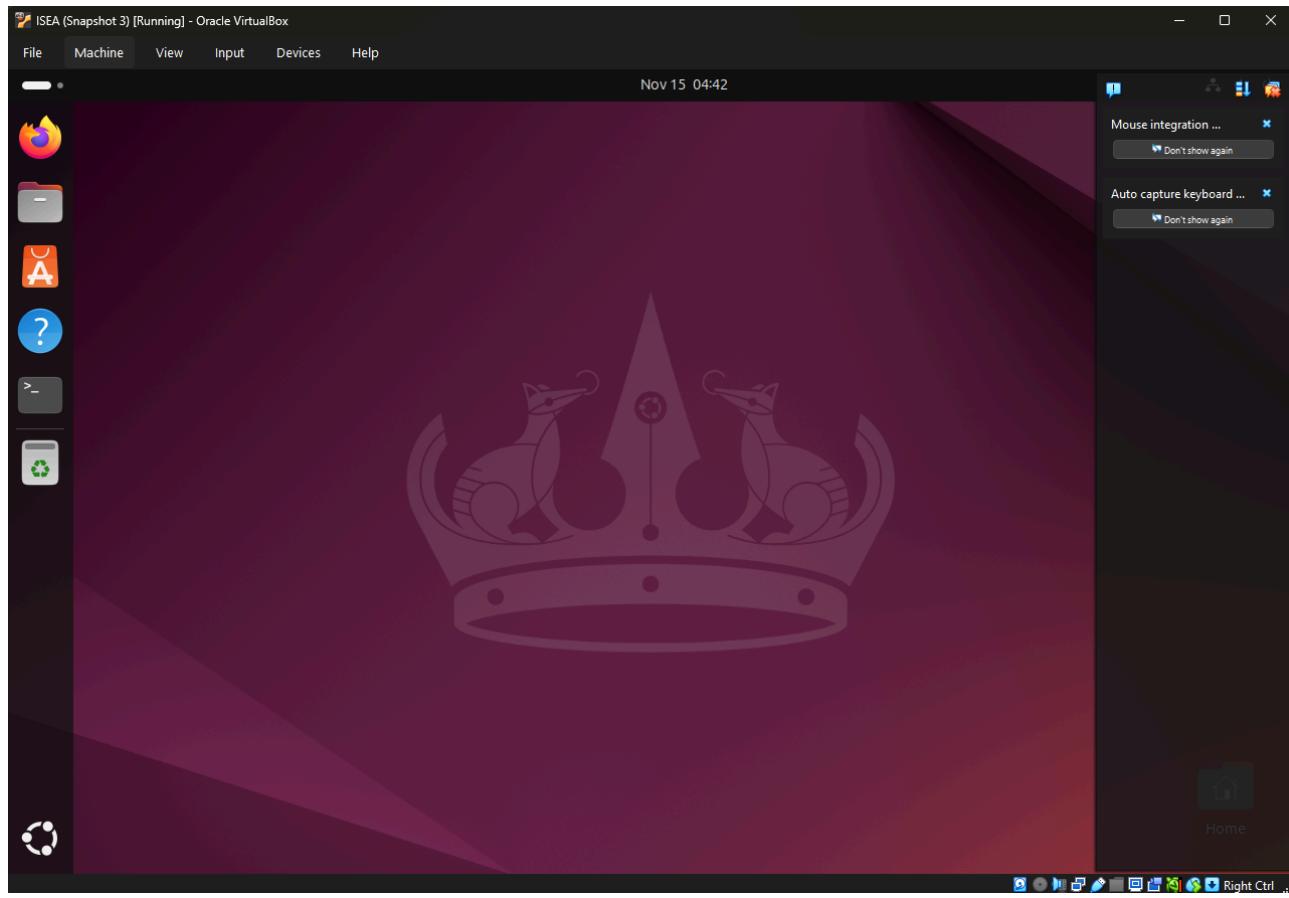
```
#####
#####
```

Obtaining Linux on My PC:

For the virtual machine application, I chose VirtualBox I also downloaded the ubuntu ISO file I proceeded with unattended guest installation with default settings. I also allocated more RAM and video Memory in settings The user name is VBoxUser



*Login Page

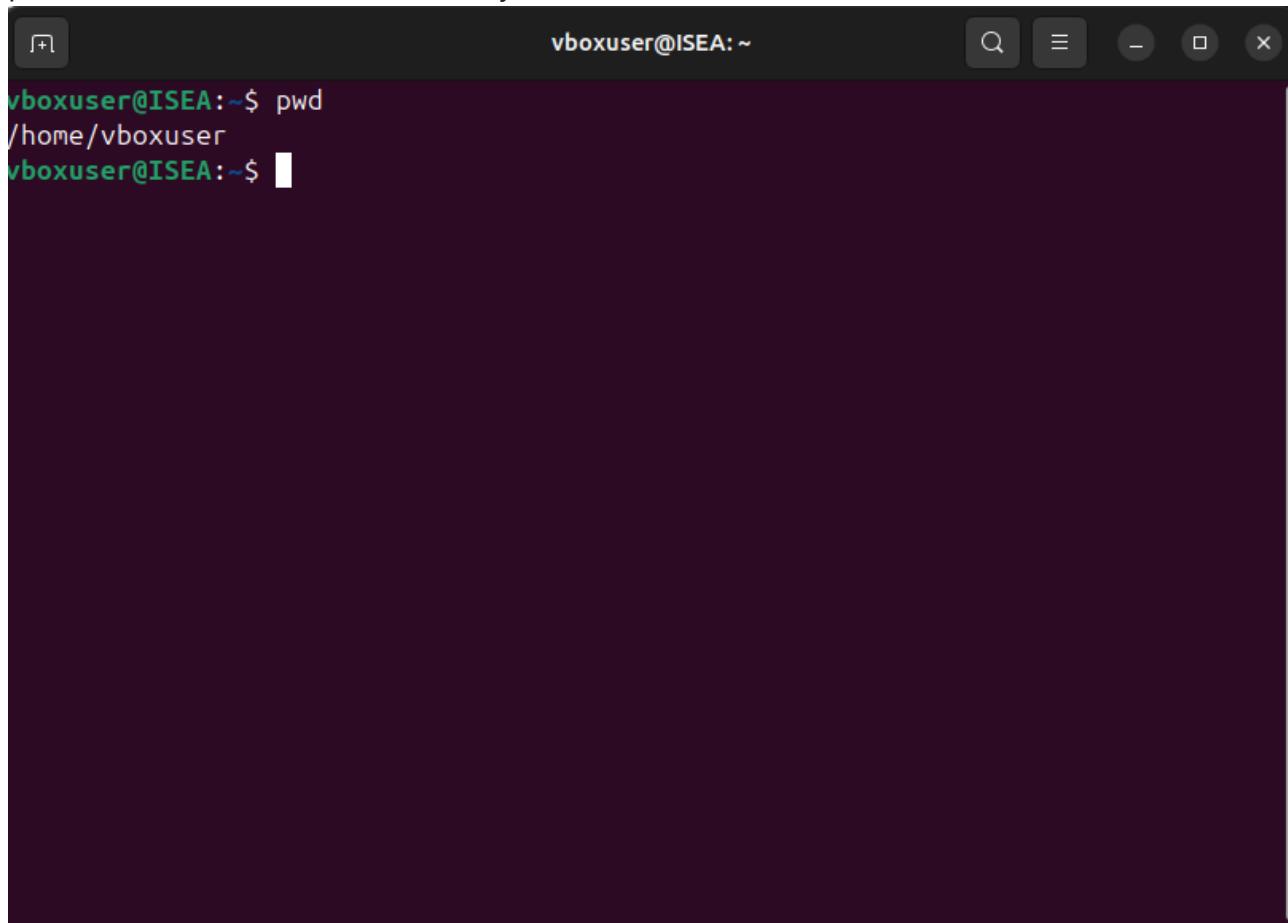


*Homepage

```
#####
#####
```

Familiarity with Ubuntu Linux:

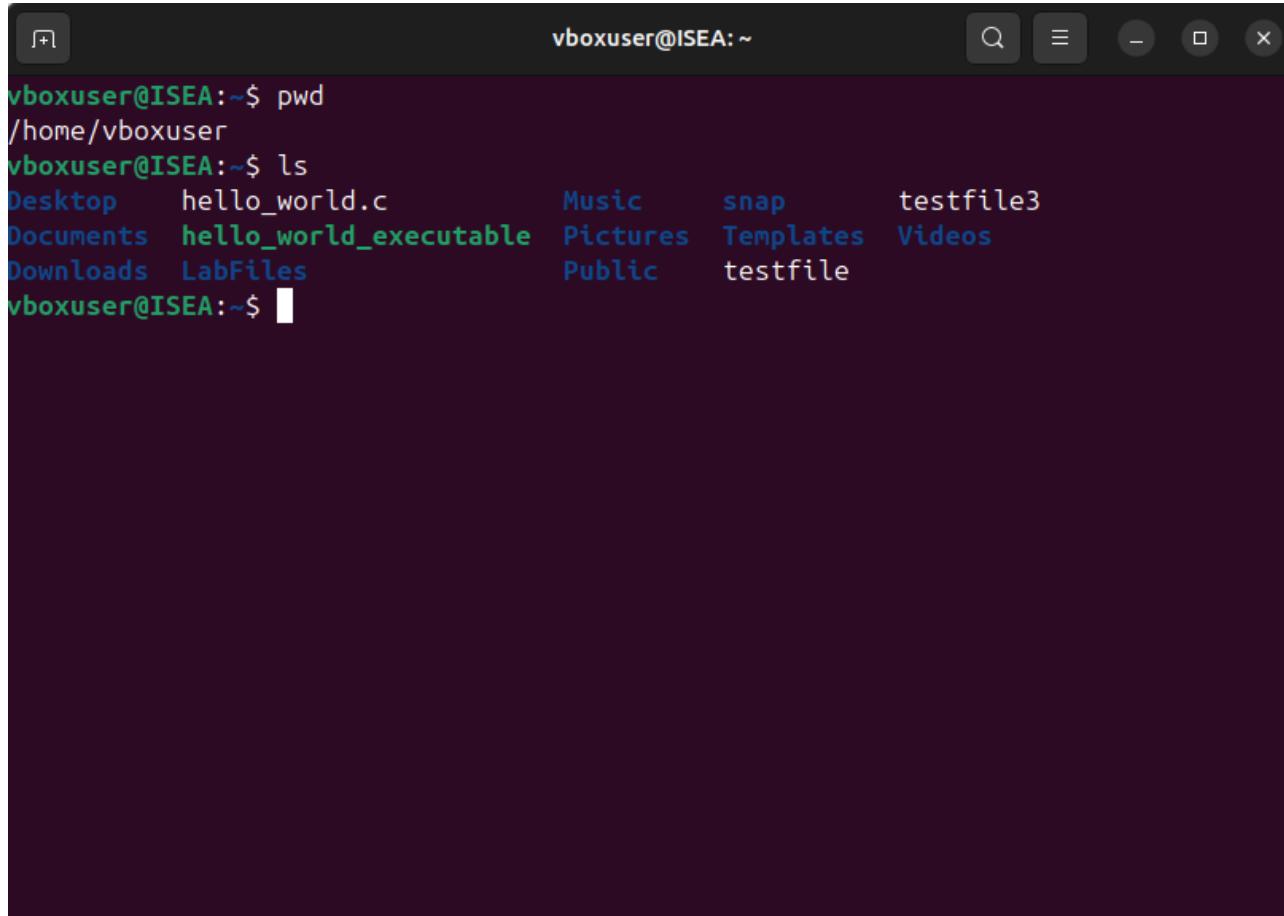
pwd shows me the current directory i am in



A screenshot of a terminal window titled "vboxuser@ISEA: ~". The window has a dark background and light-colored text. At the top, there are standard window control buttons (minimize, maximize, close) and a search bar. The terminal prompt is "vboxuser@ISEA: ~\$". Below the prompt, the command "pwd" is entered, followed by its output: "/home/vboxuser". A cursor is visible at the end of the command line.

```
vboxuser@ISEA:~$ pwd
/home/vboxuser
vboxuser@ISEA:~$
```

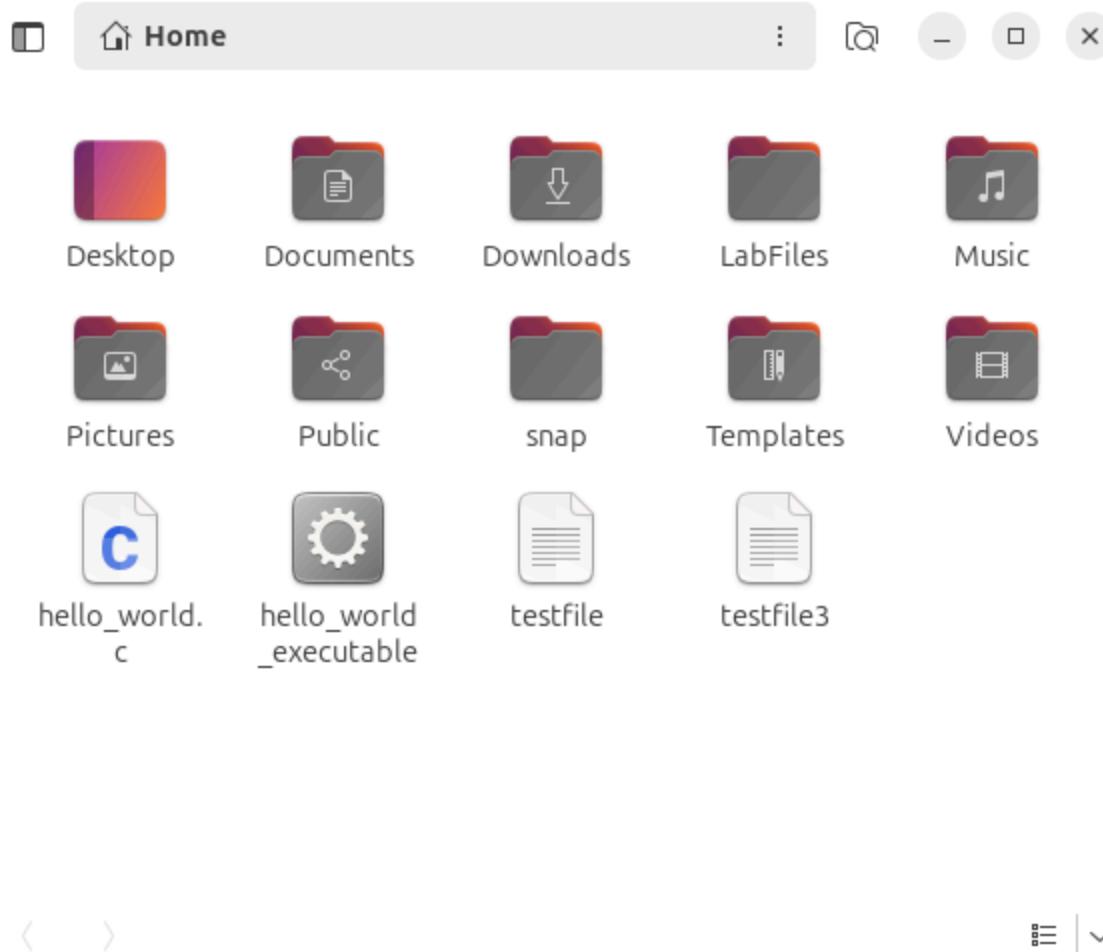
ls shows me all the files that are in my current directory i am working with



A screenshot of a terminal window titled "vboxuser@ISEA:~". The window contains the following text:

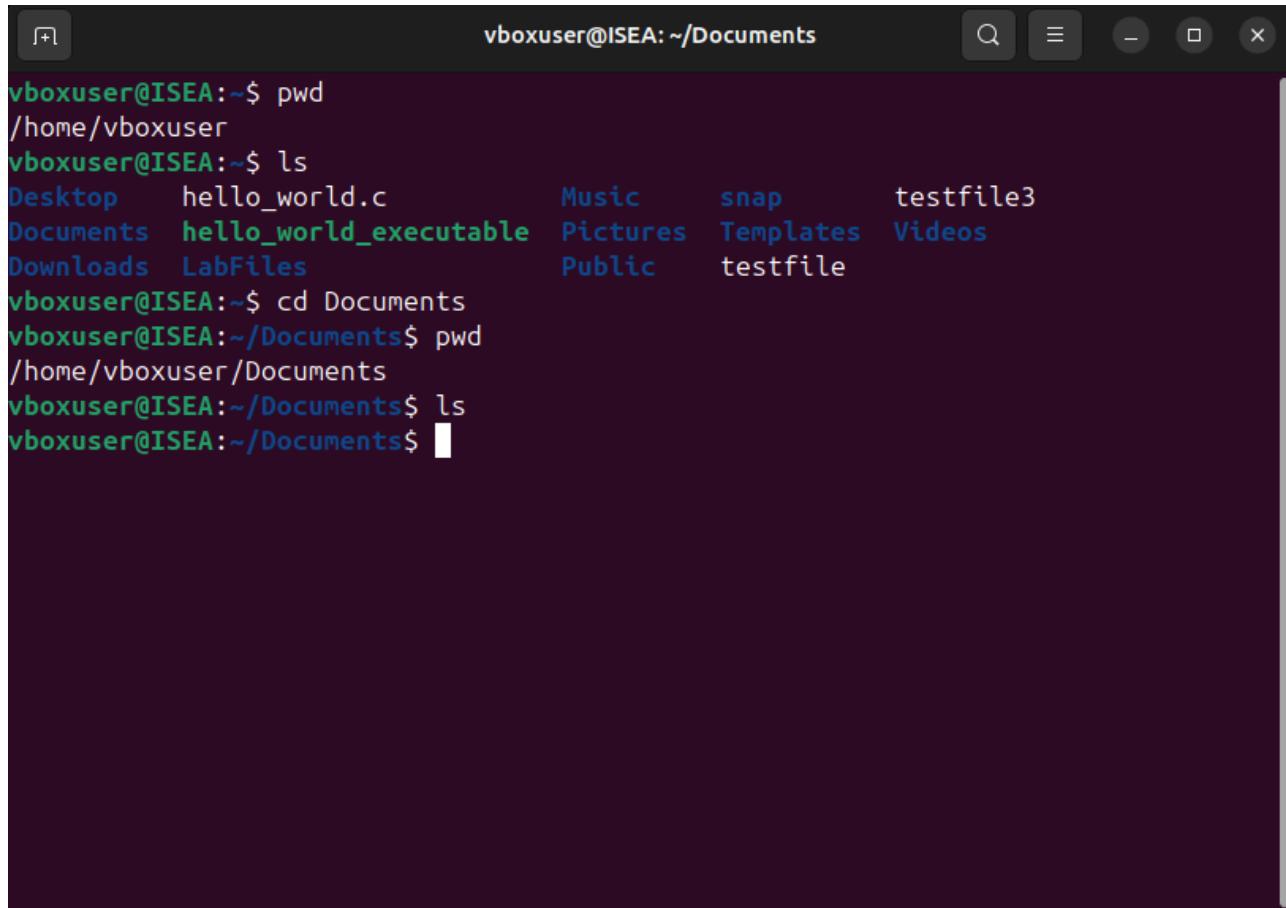
```
vboxuser@ISEA:~$ pwd  
/home/vboxuser  
vboxuser@ISEA:~$ ls  
Desktop    hello_world.c      Music      snap      testfile3  
Documents  hello_world_executable Pictures  Templates  Videos  
Downloads  LabFiles          Public     testfile  
vboxuser@ISEA:~$
```

*CLI view



*GUI view (files explorer)

cd changes my working directory to another folder in the current directory i am on. if i want to work on Documents instead of home, i would use cd Document (note it is case sensitive)



The screenshot shows a terminal window titled "vboxuser@ISEA: ~/Documents". The user runs several commands to demonstrate changing the working directory:

```
vboxuser@ISEA:~$ pwd
/home/vboxuser
vboxuser@ISEA:~$ ls
Desktop    hello_world.c      Music      snap      testfile3
Documents  hello_world_executable Pictures  Templates  Videos
Downloads  LabFiles          Public     testfile
vboxuser@ISEA:~$ cd Documents
vboxuser@ISEA:~/Documents$ pwd
/home/vboxuser/Documents
vboxuser@ISEA:~/Documents$ ls
vboxuser@ISEA:~/Documents$
```

*CLI view



Home / Documents

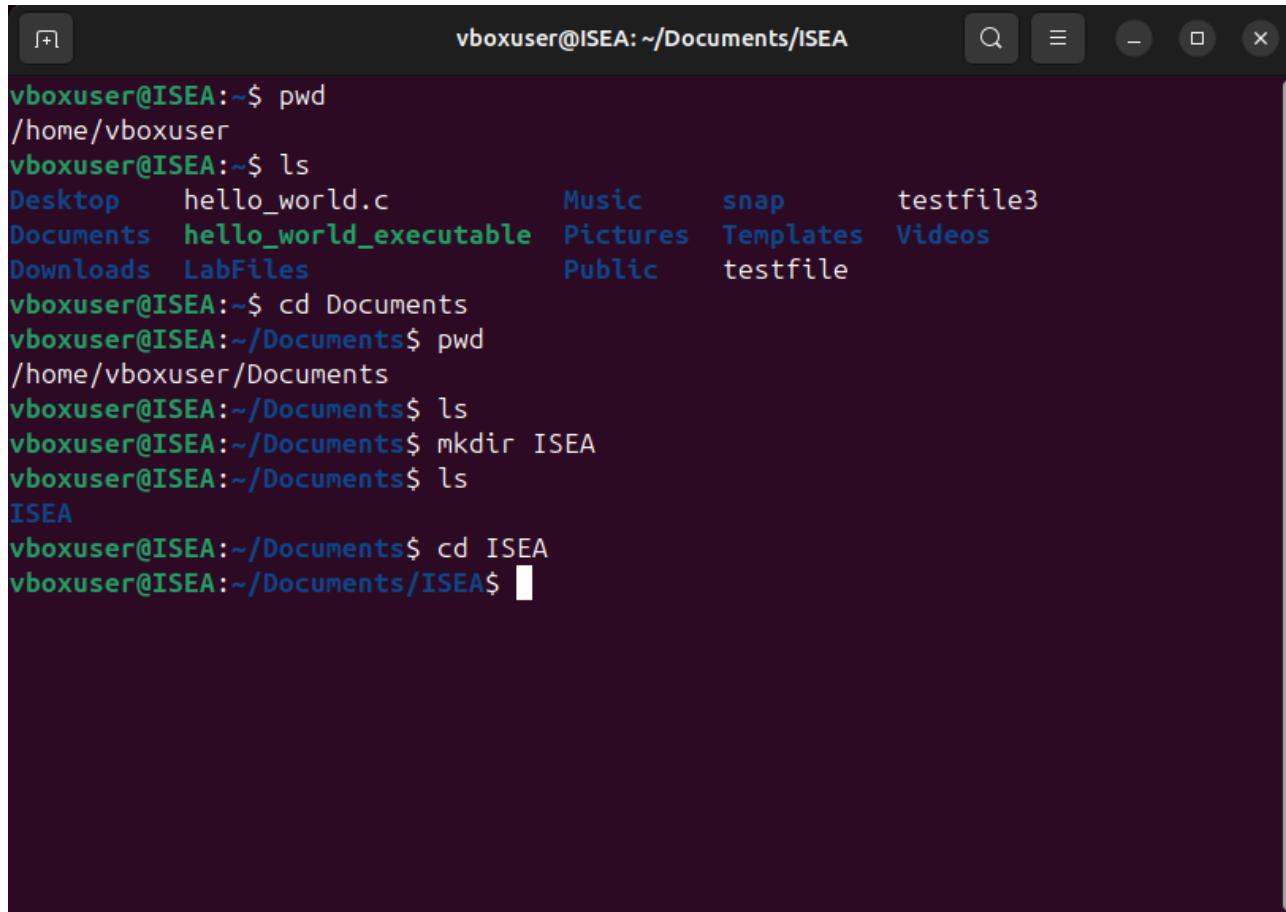


Folder is Empty



*contents of "Documents"

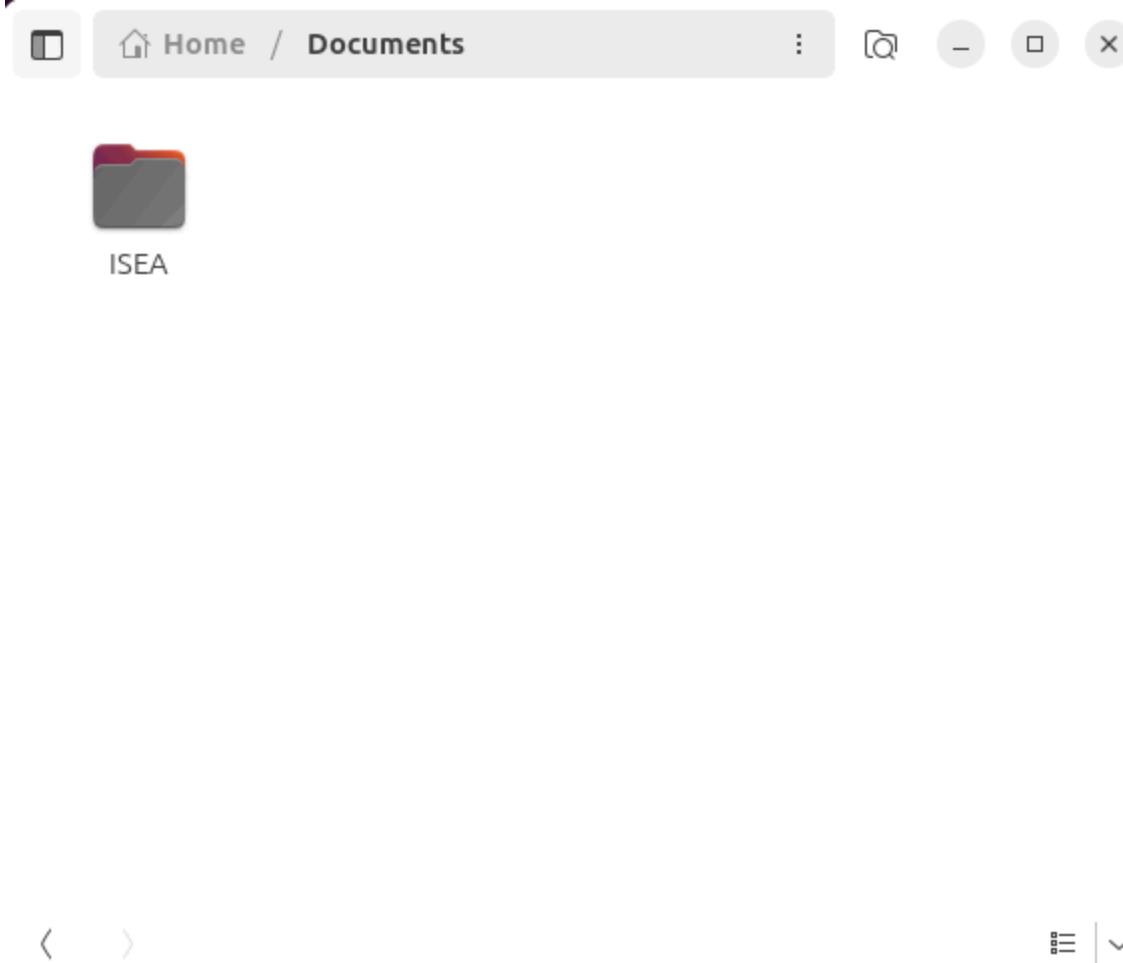
mkdir makes a folder inside the working directory i am in. I can also specify the file name. Following from the cd command, I will create a folder named "ISEA" and change directory to there



The screenshot shows a terminal window titled "vboxuser@ISEA: ~/Documents/ISEA". The user has run several commands:

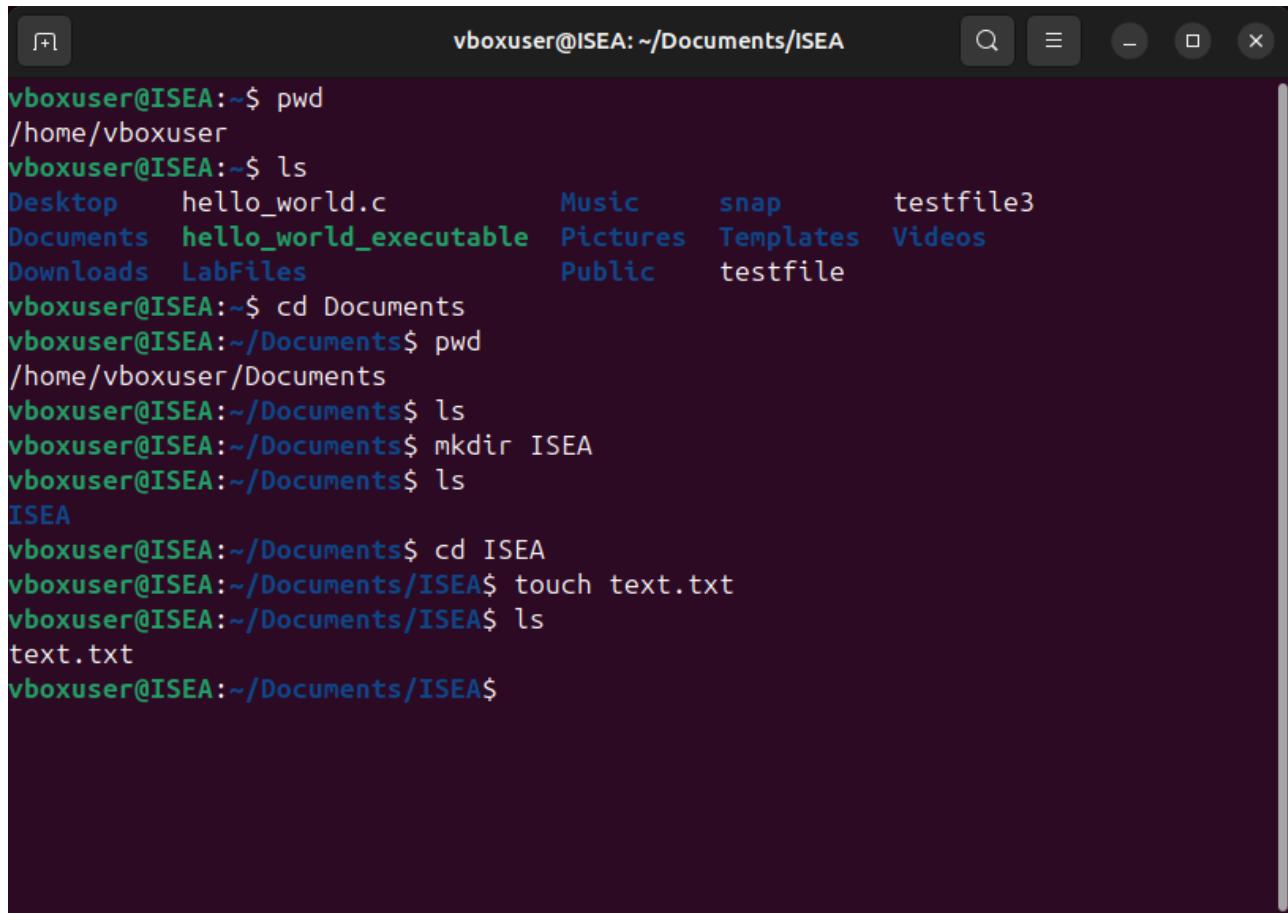
```
vboxuser@ISEA:~$ pwd  
/home/vboxuser  
vboxuser@ISEA:~$ ls  
Desktop hello_world.c Music snap testfile3  
Documents hello_world_executable Pictures Templates Videos  
Downloads LabFiles Public testfile  
vboxuser@ISEA:~$ cd Documents  
vboxuser@ISEA:~/Documents$ pwd  
/home/vboxuser/Documents  
vboxuser@ISEA:~/Documents$ ls  
vboxuser@ISEA:~/Documents$ mkdir ISEA  
vboxuser@ISEA:~/Documents$ ls  
ISEA  
vboxuser@ISEA:~/Documents$ cd ISEA  
vboxuser@ISEA:~/Documents/ISEA$
```

*CLI view



*Files view

touch creates an empty file inside the working directory. i can define the name and file extension.



```
vboxuser@ISEA:~$ pwd
/home/vboxuser
vboxuser@ISEA:~$ ls
Desktop    hello_world.c      Music      snap      testfile3
Documents  hello_world_executable Pictures  Templates  Videos
Downloads  LabFiles          Public     testfile
vboxuser@ISEA:~$ cd Documents
vboxuser@ISEA:~/Documents$ pwd
/home/vboxuser/Documents
vboxuser@ISEA:~/Documents$ ls
vboxuser@ISEA:~/Documents$ mkdir ISEA
vboxuser@ISEA:~/Documents$ ls
ISEA
vboxuser@ISEA:~/Documents$ cd ISEA
vboxuser@ISEA:~/Documents/ISEA$ touch text.txt
vboxuser@ISEA:~/Documents/ISEA$ ls
text.txt
vboxuser@ISEA:~/Documents/ISEA$
```

*CLI View



Home / Documents / ISEA



text.txt



*Files view

Exploring Man (or linux console manual)

The screenshot shows a terminal window with the title bar "vboxuser@ISEA: ~". The window contains the man(1) manual page for the "man" command. The page is divided into sections: NAME, SYNOPSIS, and DESCRIPTION. The SYNOPSIS section lists various command-line options for "man". The DESCRIPTION section explains that "man" is the system's manual pager and describes how it finds and displays manual pages based on the arguments provided.

```

MAN(1)                               Manual pager utils                               MAN(1)

NAME
    man - an interface to the system reference manuals

SYNOPSIS
    man [man options] [[section] page ...] ...
    man -k [apropos options] regexp ...
    man -K [man options] [section] term ...
    man -f [whatis options] page ...
    man -l [man options] file ...
    man -w|-W [man options] page ...

DESCRIPTION
    man is the system's manual pager. Each page argument given to man is
    normally the name of a program, utility or function. The manual page
    associated with each of these arguments is then found and displayed. A
    section, if provided, will direct man to look only in that section of
    the manual. The default action is to search in all of the available
    sections following a pre-defined order (see DEFAULTS), and to show only
    the first page found, even if page exists in several sections.

```

The table below shows the section numbers of the manual followed by the
Manual page man(1) line 1 (press h for help or q to quit)

*1st page of manual, too many pages in total to document

```
#####
#####
```

Session 1b - PM

```
#####
#####
```

Linux Services:

"systemctl list-units --type=service" lists all services installed

```
vboxuser@ISEA:~
```

UNIT	LOAD	ACTIVE	SUB	DESCRIPTION
accounts-daemon.service	loaded	active	running	Accounts Service
alsa-restore.service	loaded	active	exited	Save/Restore Sound Card State
apache2.service	loaded	active	running	The Apache HTTP Server
apparmor.service	loaded	active	exited	Load AppArmor profiles
apport.service	loaded	active	exited	automatic crash report generation
avahi-daemon.service	loaded	active	running	Avahi mDNS/DNS-SD Stack
colord.service	loaded	active	running	Manage, Install and Generate Color Profiles
console-setup.service	loaded	active	exited	Set console font and keymap
cron.service	loaded	active	running	Regular background program processing daemon
cups-browsed.service	loaded	active	running	Make remote CUPS printers available locally
cups.service	loaded	active	running	CUPS Scheduler
dbus.service	loaded	active	running	D-Bus System Message Bus
fwupd.service	loaded	active	running	Firmware update daemon
gdm.service	loaded	active	running	GNOME Display Manager
gnome-remote-desktop.service	loaded	active	running	GNOME Remote Desktop
kerneloops.service	loaded	active	running	Tool to automatically collect and submit kernel crash
keyboard-setup.service	loaded	active	exited	Set the console keyboard layout
kmod-static-nodes.service	loaded	active	exited	Create List of Static Device Nodes
ModemManager.service	loaded	active	running	Modem Manager
NetworkManager-wait-online.service	loaded	active	exited	Network Manager Wait Online
NetworkManager.service	loaded	active	running	Network Manager
openvpn.service	loaded	active	exited	OpenVPN service

lines 1-23/68 36%

*1st page of services

```
vboxuser@ISEA:~
```

systemd-sysctl.service	loaded	active	exited	Apply Kernel Variables
systemd-timesyncd.service	loaded	active	running	Network Time Synchronization
systemd-tmpfiles-setup-dev-early.service	loaded	active	exited	Create Static Device Nodes in /dev gracefully
systemd-tmpfiles-setup-dev.service	loaded	active	exited	Create Static Device Nodes in /dev
systemd-tmpfiles-setup.service	loaded	active	exited	Create Volatile Files and Directories
systemd-udev-trigger.service	loaded	active	exited	Coldplug All udev Devices
systemd-udevd.service	loaded	active	running	Rule-based Manager for Device Events and Files
systemd-update-utmp.service	loaded	active	exited	Record System Boot/Shutdown in UTMP
systemd-user-sessions.service	loaded	active	exited	Permit User Sessions
udisks2.service	loaded	active	running	Disk Manager
ufw.service	loaded	active	exited	Uncomplicated firewall
unattended-upgrades.service	loaded	active	running	Unattended Upgrades Shutdown
upower.service	loaded	active	running	Daemon for power management
user-runtime-dir@1000.service	loaded	active	exited	User Runtime Directory /run/user/1000
user@1000.service	loaded	active	running	User Manager for UID 1000
wpa_supplicant.service	loaded	active	running	WPA supplicant

Legend: LOAD → Reflects whether the unit definition was properly loaded.
 ACTIVE → The high-level unit activation state, i.e. generalization of SUB.
 SUB → The low-level unit activation state, values depend on unit type.

60 loaded units listed. Pass --all to see loaded but inactive units, too.
 To show all installed unit files use 'systemctl list-unit-files'.
 lines 46-68/68 (END)

*last page of services

page can be navigated using arrow keys

to test start/stopping services with CLI, i will be using the UFW service as an example

before command

```
vboxuser@ISEA:~
```

systemd-sysctl.service	loaded	active	exited	Apply Kernel Variables
systemd-timesyncd.service	loaded	active	running	Network Time Synchronization
systemd-tmpfiles-setup-dev-early.service	loaded	active	exited	Create Static Device Nodes in /dev gracef
systemd-tmpfiles-setup-dev.service	loaded	active	exited	Create Static Device Nodes in /dev
systemd-tmpfiles-setup.service	loaded	active	exited	Create Volatile Files and Directories
systemd-udev-trigger.service	loaded	active	exited	Coldplug All udev Devices
systemd-udevd.service	loaded	active	running	Rule-based Manager for Device Events and
systemd-update-utmp.service	loaded	active	exited	Record System Boot/Shutdown in UTMP
systemd-user-sessions.service	loaded	active	exited	Permit User Sessions
udisks2.service	loaded	active	running	Disk Manager
ufw.service	loaded	active	exited	Uncomplicated firewall
unattended-upgrades.service	loaded	active	running	Unattended Upgrades Shutdown
upower.service	loaded	active	running	Daemon for power management
user-runtime-dir@1000.service	loaded	active	exited	User Runtime Directory /run/user/1000
user@1000.service	loaded	active	running	User Manager for UID 1000
wpa_supplicant.service	loaded	active	running	WPA supplicant

Legend: LOAD → Reflects whether the unit definition was properly loaded.
ACTIVE → The high-level unit activation state, i.e. generalization of SUB.
SUB → The low-level unit activation state, values depend on unit type.

60 loaded units listed. Pass --all to see loaded but inactive units, too.
To show all installed unit files use 'systemctl list-unit-files'.
lines 46-68/68 (END)

*highlighted is UFW

after command

```
vboxuser@ISEA:~
```

systemd-resolved.service	loaded	active	running	Network Name Resolution
systemd-sysctl.service	loaded	active	exited	Apply Kernel Variables
systemd-timesyncd.service	loaded	active	running	Network Time Synchronization
systemd-tmpfiles-setup-dev-early.service	loaded	active	exited	Create Static Device Nodes in /dev gracef
systemd-tmpfiles-setup-dev.service	loaded	active	exited	Create Static Device Nodes in /dev
systemd-tmpfiles-setup.service	loaded	active	exited	Create Volatile Files and Directories
systemd-udev-trigger.service	loaded	active	exited	Coldplug All udev Devices
systemd-udevd.service	loaded	active	running	Rule-based Manager for Device Events and
systemd-update-utmp.service	loaded	active	exited	Record System Boot/Shutdown in UTMP
systemd-user-sessions.service	loaded	active	exited	Permit User Sessions
udisks2.service	loaded	active	running	Disk Manager
unattended-upgrades.service	loaded	active	running	Unattended Upgrades Shutdown
upower.service	loaded	active	running	Daemon for power management
user-runtime-dir@1000.service	loaded	active	exited	User Runtime Directory /run/user/1000
user@1000.service	loaded	active	running	User Manager for UID 1000
wpa_supplicant.service	loaded	active	running	WPA supplicant

Legend: LOAD → Reflects whether the unit definition was properly loaded.
ACTIVE → The high-level unit activation state, i.e. generalization of SUB.
SUB → The low-level unit activation state, values depend on unit type.

59 loaded units listed. Pass --all to see loaded but inactive units, too.
To show all installed unit files use 'systemctl list-unit-files'.
lines 45-67/67 (END)

*note that number of total active services went down and UFW cannot be found

checking service status using systemctl status (using UFW as example)

if service is on

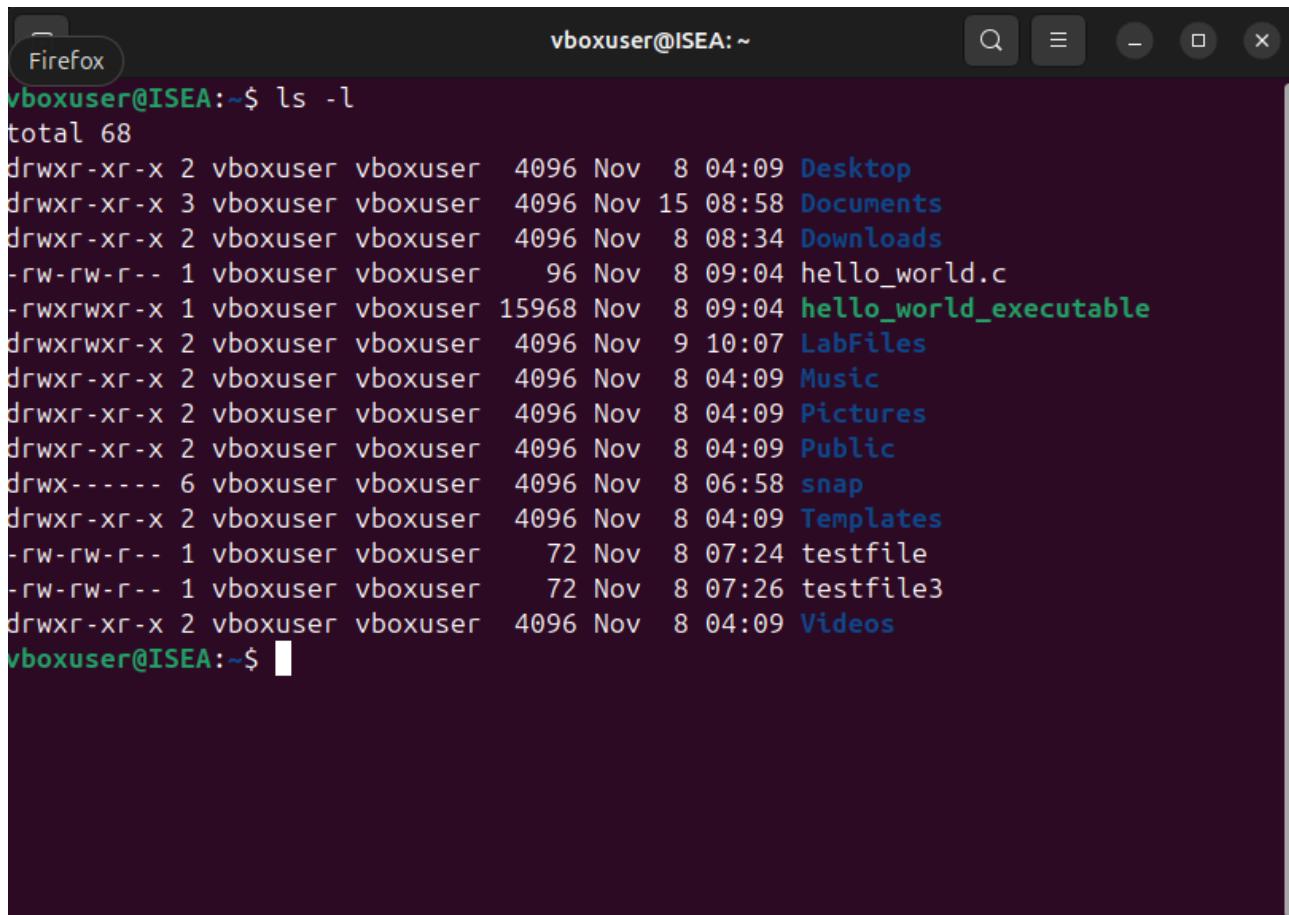
if service is off

```
vboxuser@ISEA:~$ sudo systemctl stop ufw
vboxuser@ISEA:~$ sudo systemctl status ufw
● ufw.service - Uncomplicated firewall
   Loaded: loaded (/usr/lib/systemd/system/ufw.service; enabled; preset: enabled)
     Active: inactive (dead) since Sun 2025-11-16 02:00:41 UTC; 4s ago
   Duration: 40min 12.279s
     Docs: man:ufw(8)
   Process: 5004 ExecStop=/usr/lib/ufw/ufw-init stop (code=exited, status=0/SUCCESS)
 Main PID: 346 (code=exited, status=0/SUCCESS)
    CPU: 7ms

Nov 16 01:20:29 ISEA systemd[1]: Starting ufw.service - Uncomplicated firewall...
Nov 16 01:20:29 ISEA systemd[1]: Finished ufw.service - Uncomplicated firewall.
Nov 16 02:00:41 ISEA systemd[1]: Stopping ufw.service - Uncomplicated firewall...
Nov 16 02:00:41 ISEA ufw-init[5004]: Skip stopping firewall: ufw (not enabled)
Nov 16 02:00:41 ISEA systemd[1]: ufw.service: Deactivated successfully.
Nov 16 02:00:41 ISEA systemd[1]: Stopped ufw.service - Uncomplicated firewall.
vboxuser@ISEA:~$ █
```

Linux Permissions:

output for ls -l



vboxuser@ISEA:~\$ ls -l

```
total 68
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 04:09 Desktop
drwxr-xr-x 3 vboxuser vboxuser 4096 Nov 15 08:58 Documents
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 08:34 Downloads
-rw-rw-r-- 1 vboxuser vboxuser   96 Nov  8 09:04 hello_world.c
-rwxrwxr-x 1 vboxuser vboxuser 15968 Nov  8 09:04 hello_world_executable
drwxrwxr-x 2 vboxuser vboxuser 4096 Nov  9 10:07 LabFiles
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 04:09 Music
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 04:09 Pictures
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 04:09 Public
drwx----- 6 vboxuser vboxuser 4096 Nov  8 06:58 snap
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 04:09 Templates
-rw-rw-r-- 1 vboxuser vboxuser   72 Nov  8 07:24 testfile
-rw-rw-r-- 1 vboxuser vboxuser   72 Nov  8 07:26 testfile3
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 04:09 Videos
vboxuser@ISEA:~$
```

*r means read, w means write and x means execute. the 1st column is for owner, 2nd for group and 3rd for others. d denotes that the file is a directory

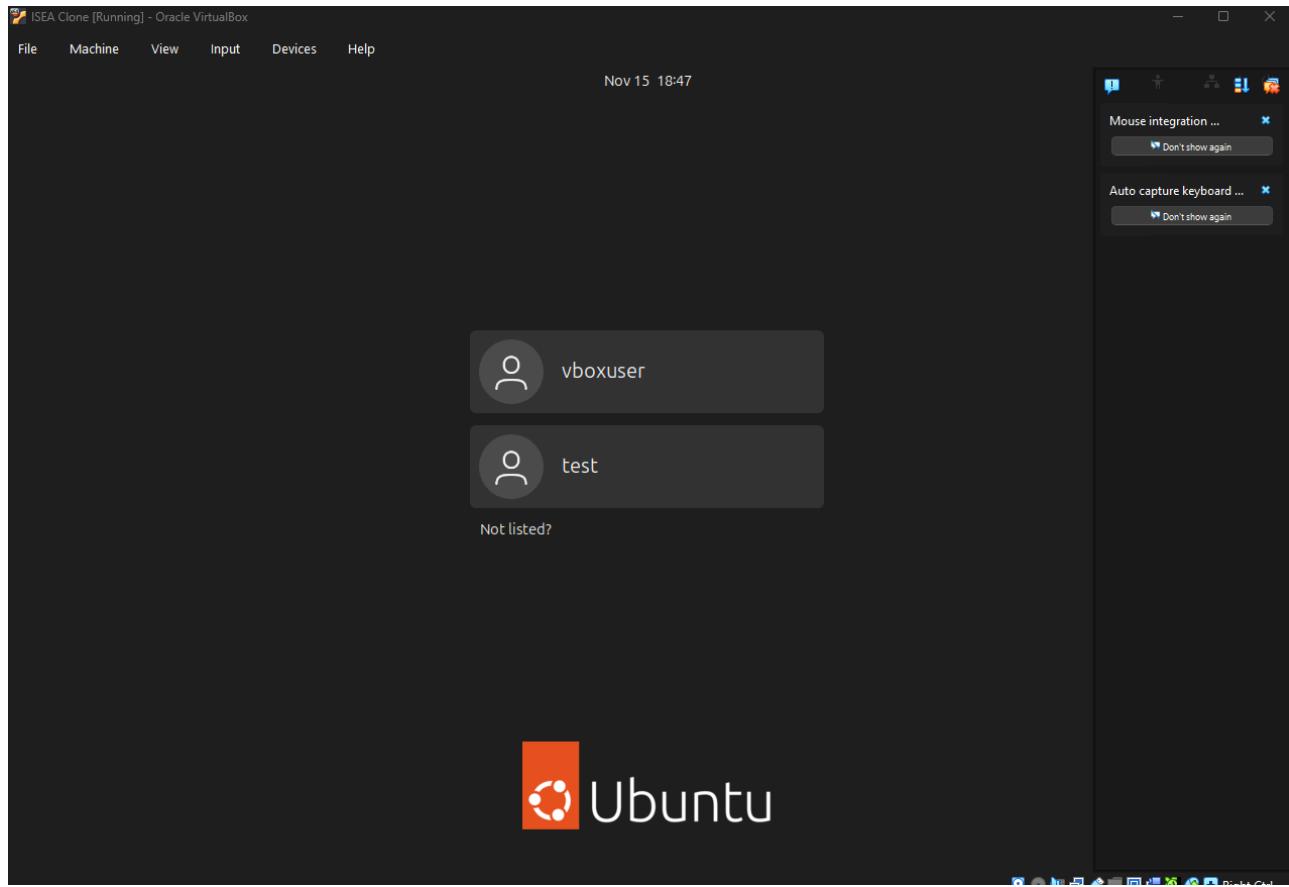
changing permissions (changing testfile to rw -r -r)

```
vboxuser@ISEA:~$ ls -l
total 68
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 04:09 Desktop
drwxr-xr-x 3 vboxuser vboxuser 4096 Nov 15 08:58 Documents
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 08:34 Downloads
-rw-rw-r-- 1 vboxuser vboxuser    72 Nov  8 07:24 testfile
-rw-rw-r-- 1 vboxuser vboxuser    72 Nov  8 07:26 testfile3
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 04:09 Public
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 06:58 snap
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 04:09 Templates
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 04:09 Videos
vboxuser@ISEA:~$ chmod 644 testfile
vboxuser@ISEA:~$ ls -l
total 68
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 04:09 Desktop
drwxr-xr-x 3 vboxuser vboxuser 4096 Nov 15 08:58 Documents
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 08:34 Downloads
-rw-rw-r-- 1 vboxuser vboxuser    96 Nov  8 09:04 hello_world.c
-rwxrwxr-x 1 vboxuser vboxuser 15968 Nov  8 09:04 hello_world_executable
drwxrwxr-x 2 vboxuser vboxuser 4096 Nov  9 10:07 LabFiles
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 04:09 Music
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 04:09 Pictures
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 04:09 Public
drwxr-xr-x 6 vboxuser vboxuser 4096 Nov  8 06:58 snap
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 04:09 Templates
-rw-r--r-- 1 vboxuser vboxuser    72 Nov  8 07:24 testfile
-rw-rw-r-- 1 vboxuser vboxuser    72 Nov  8 07:26 testfile3
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 04:09 Videos
vboxuser@ISEA:~$
```

*highlighted is testfile

changing ownership of file (from Vboxuser > test)

new account (test)



before changing owner

A screenshot of a terminal window titled "vboxuser@ISEA:~". The terminal displays the output of the "ls -l" command, listing various system directories and files. The output is as follows:

```
vboxuser@ISEA:~$ ls -l
total 68
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 04:09 Desktop
drwxr-xr-x 3 vboxuser vboxuser 4096 Nov 15 08:58 Documents
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 08:34 Downloads
-rw-rw-r-- 1 vboxuser vboxuser    96 Nov  8 09:04 hello_world.c
-rwxrwxr-x 1 vboxuser vboxuser 15968 Nov  8 09:04 hello_world_executable
drwxrwxr-x 2 vboxuser vboxuser 4096 Nov  9 10:07 LabFiles
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 04:09 Music
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 04:09 Pictures
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 04:09 Public
drwx----- 6 vboxuser vboxuser 4096 Nov  8 06:58 snap
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 04:09 Templates
-rw-rw-r-- 1 vboxuser vboxuser   72 Nov  8 07:24 testfile
-rw-rw-r-- 1 vboxuser vboxuser   72 Nov  8 07:26 testfile3
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov  8 04:09 Videos
vboxuser@ISEA:~$
```

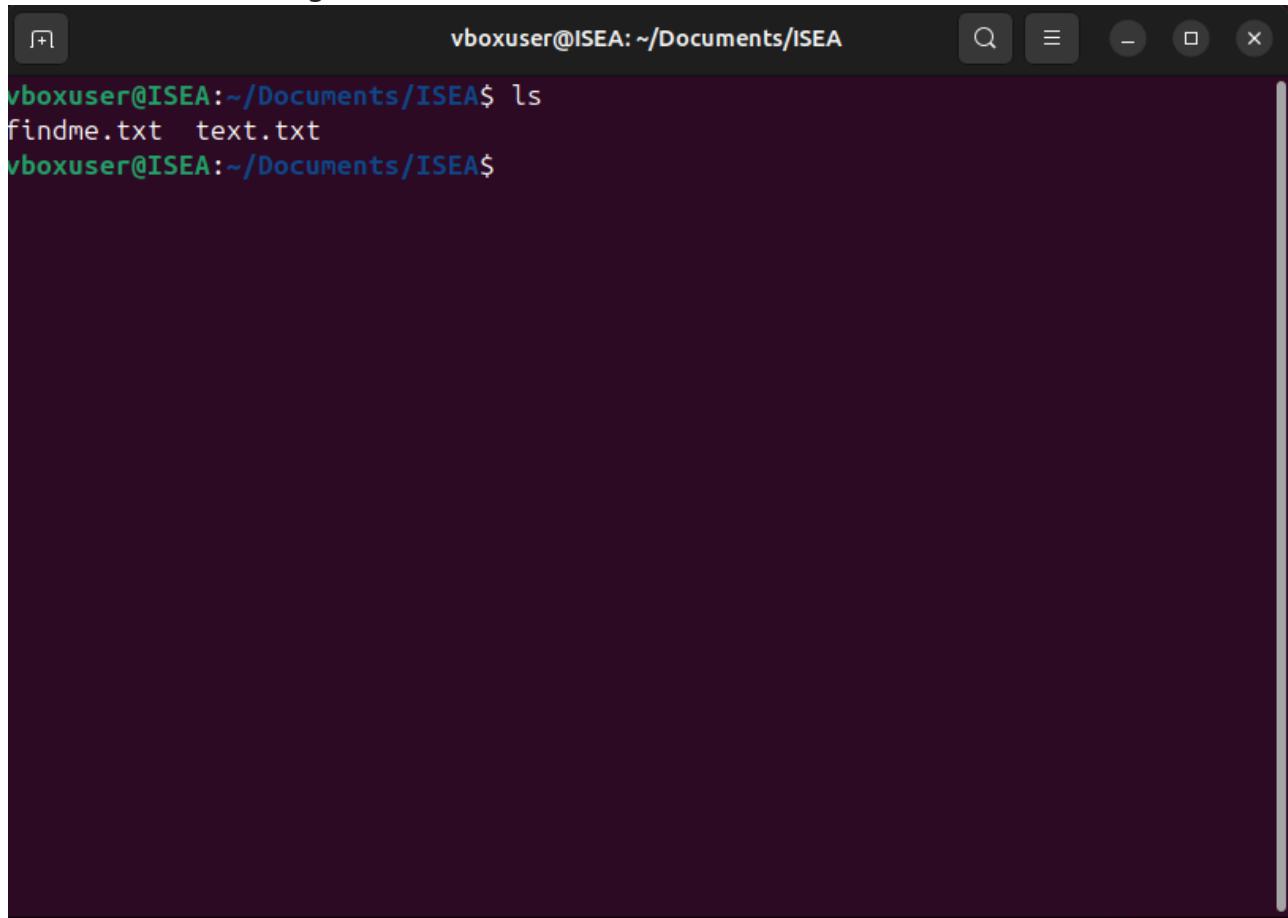
after changing owner

```
vboxuser@ISEA:~ drwxr-xr-x 2 vboxuser vboxuser 4096 Nov 8 04:09 Public  
drwx----- 6 vboxuser vboxuser 4096 Nov 8 06:58 snap  
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov 8 04:09 Templates  
-rw-r--r-- 1 vboxuser vboxuser 72 Nov 8 07:24 testfile  
-rw-rw-r-- 1 vboxuser vboxuser 72 Nov 8 07:26 testfile3  
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov 8 04:09 Videos  
vboxuser@ISEA:~$ sudo chown test testfile  
vboxuser@ISEA:~$ ls -l  
total 68  
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov 8 04:09 Desktop  
drwxr-xr-x 3 vboxuser vboxuser 4096 Nov 15 08:58 Documents  
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov 8 08:34 Downloads  
-rw-rw-r-- 1 vboxuser vboxuser 96 Nov 8 09:04 hello_world.c  
-rwxrwxr-x 1 vboxuser vboxuser 15968 Nov 8 09:04 hello_world_executable  
drwxrwxr-x 2 vboxuser vboxuser 4096 Nov 9 10:07 LabFiles  
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov 8 04:09 Music  
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov 8 04:09 Pictures  
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov 8 04:09 Public  
drwx----- 6 vboxuser vboxuser 4096 Nov 8 06:58 snap  
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov 8 04:09 Templates  
-rw-r--r-- 1 test vboxuser 72 Nov 8 07:24 testfile  
-rw-rw-r-- 1 vboxuser vboxuser 72 Nov 8 07:26 testfile3  
drwxr-xr-x 2 vboxuser vboxuser 4096 Nov 8 04:09 Videos  
vboxuser@ISEA:~$
```

*note that the testfile (highlighted) changed from vboxuser to test in the 1st row of names

Searching Filesystems:

for this lab, ill be using findme.txt



A screenshot of a terminal window titled "vboxuser@ISEA: ~/Documents/ISEA". The window shows the command "ls" being run, which lists two files: "findme.txt" and "text.txt". The terminal has a dark background with light-colored text. The title bar and window controls are visible at the top.

```
vboxuser@ISEA:~/Documents/ISEA$ ls
findme.txt  text.txt
vboxuser@ISEA:~/Documents/ISEA$
```

*file location

the contents of the file

The screenshot shows a terminal window with the title "vboxuser@ISEA: ~/Documents/ISEA". The file "findme.txt" is open in the nano editor. The content of the file is:

```
GNU nano 7.2          findme.txt
Hello there, you have found me
yayayayayayayayayay
nyehehehehhee
```

The nano editor interface includes a menu bar with options like Help, Write Out, Where Is, Cut, Execute, Location, Exit, Read File, Replace, Paste, Justify, and Go To Line. A status bar at the bottom indicates "[Read 5 lines]".

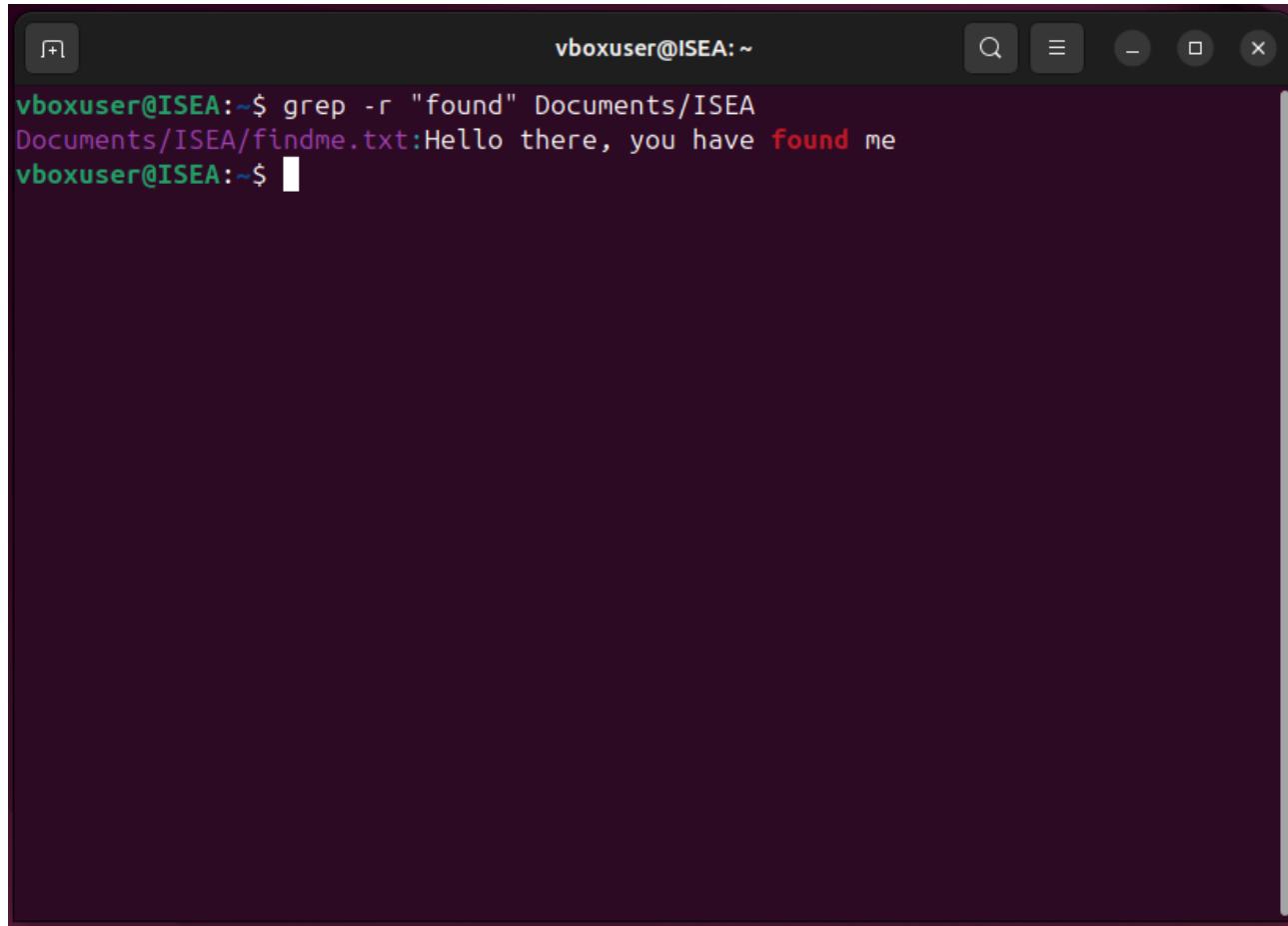
using find from home directory

The screenshot shows a terminal window with the title "vboxuser@ISEA: ~". The user runs the command "find Documents/ISEA -name \"findme.txt\"". The output is:

```
vboxuser@ISEA:~$ find Documents/ISEA -name "findme.txt"
Documents/ISEA/findme.txt
vboxuser@ISEA:~$
```

*if searching specifically for this file, name must include name + extension. **searching just for extension will show all files with said extension

using grep



A screenshot of a terminal window titled "vboxuser@ISEA:~". The terminal shows the command "grep -r "found" Documents/ISEA" being run, followed by the output: "Documents/ISEA/findme.txt:Hello there, you have **found** me". The word "found" is highlighted in red.

*grep prints the line where the search word is found, but highlights the search word

```
#####
#####
```

Session 2a - AM

```
#####
#####
```

TCO:

*the following content is for calculating TCO instead of cloud providers since during the class time, we were told to do calculations on TCO for printers

Company: Assuming company "A" uses paper prints for supporting documents in business meetings and meeting notes. Assumed 140 pages are printed a week. No scanning of documents will be done. The printer is expected to be used for a minimum of 5 years and will be left idle from Monday to Friday, 8:00 am to 6:00 pm (50 hours in total). Assume even use of all colours during coloured prints, and black is used 3x more than CMY.

Consumables used (a year): 6850 sheets of paper (assume all single-sided prints) 2350 hrs left on/powered (940hrs active, 1410 hrs idle)

Printers:

MFC-J3940DW Inkjet Printer (\$718) HP Color LaserJet Pro MFP 3303fdw Printer (\$599) HL-L3240CDW Laser Printer (\$368) HL-L3230CDN Laser Printer (\$358)

specs:

MFC-J3940DW Inkjet Printer (\$718): 3k pages for black (\$54/cartridge) 1.5k pages for colour (CMY, \$92/pack) 2 black cartridges, 1 colored refill a year 5.5W active, 0.9W idle, 0.03W off 28IPM prints 500 sheets capacity Prints up to A3 Inkjet printer Have scan and fax

HP Color LaserJet Pro MFP 3303fdw Printer (\$599) 3.2k pages for black (\$144/cartridge) 2.5k pages for colour (\$165.40/cartridge) 2 black cartridges refill a year, one coloured refill every other year 416W printing, 7.6W ready, 0.95W idle, 0.05W off 25 PPM 500 sheets capacity Up to A4 prints LaserJet Printer Have scan and fax

HL-L3240CDW Laser Printer (\$368) 3k pages, black (\$117/catridge) 2.3k Pages, coloured (\$138/catridge, CMY) 2 black refills a year, 1 colour refill every 2 years Don't need to refill drum (\$200, 50k pages refill if needed) 70W printing, 10W idle, 0.04W off Relatively quiet Up to A4 prints 250 sheet capacity 26PPM

HL-L3230CDN Laser Printer (\$358) (Discontinued when rewriting the Readme file):

3k pages black (\$121/catridge) 2.3k pages, coloured (\$143/catridge, CMY) 2 black refills a year, 1 coloured every 2 years 1 refill of drum is needed for 5 years (\$221, 18k pages) 75W printing, 8.8W idle, 0.04W off 250 sheet capacity Up to A4 Prints 18PPM

Power cost (in order):

940h printing, 1410h idle/ready(HP), 6410h off

5170, 1269, 192.3 : \$1991.38 391040, 1672, 320.5 : \$118,027.66 68500, 14100, 256.4 :
\$24,881.78 70500, 12408, 256.4 : 24,974.27

Paper cost:

Total paper use = 34250 = 68.5 REAMS Assuming company has a contract with PaperOne
for 70g paper 100 REAMS at 3.45/REAM = \$345 Used = ~\$236.33

TCO (in order): 718 + 1000 + 236.33 + 1991.38 = \$3,945.71 599 + 3921 + 118027.66 +
236.33 = \$122,783.33 368 + 2412 + 24881.78 + 236.33 = \$27,898.11 358 + 24974.27 +
2,497 + 236.33 = \$28,065.6

*this is before adding maintenance/repairs, which can be up to around 10-20% of TCO, as
well as accounting for inflation

Conclusion: For Company "A", the HL-L3240CDW Laser Printer is the best printer for them
as it has the lowest TCO.

Reflection:

If the printer was for home user that prints 5 pages a day, the best printer (for TCO)
changes. However, if I were to choose from the 4 options I gave, it would be the HL-
L3230CDN Laser Printer, as it is cheaper to purchase as although it has a higher TCO for a
company, it would be significantly lower for a home user as significantly lesser prints is
done and the user can unplug the printer from the power outlet when not in use.

Apart from TCO, the printer's capability, compatibility and upfront cost also needs to be
taken into consideration when choosing. If the company was an arts company that prints
artwork, than the MFC-J3940DW Inkjet Printer would have been the better choice as it is an
InkJet printer.

For a large workgroup, the ideal printer would have a high PPM count, high sheet capacity and good reliability as we want to reduce the time wasted on waiting for a printer to finish its task, time used to refill the paper tray and resources spent/hours wasted on repairs. Assuming that the chosen printers don't break down, the TCO gap between all of them will remain the same. However, the only time the TCO will be the same is if one printer keeps breaking down and require maintenance/repairs.

```
#####
#####
```

Session 2b - PM

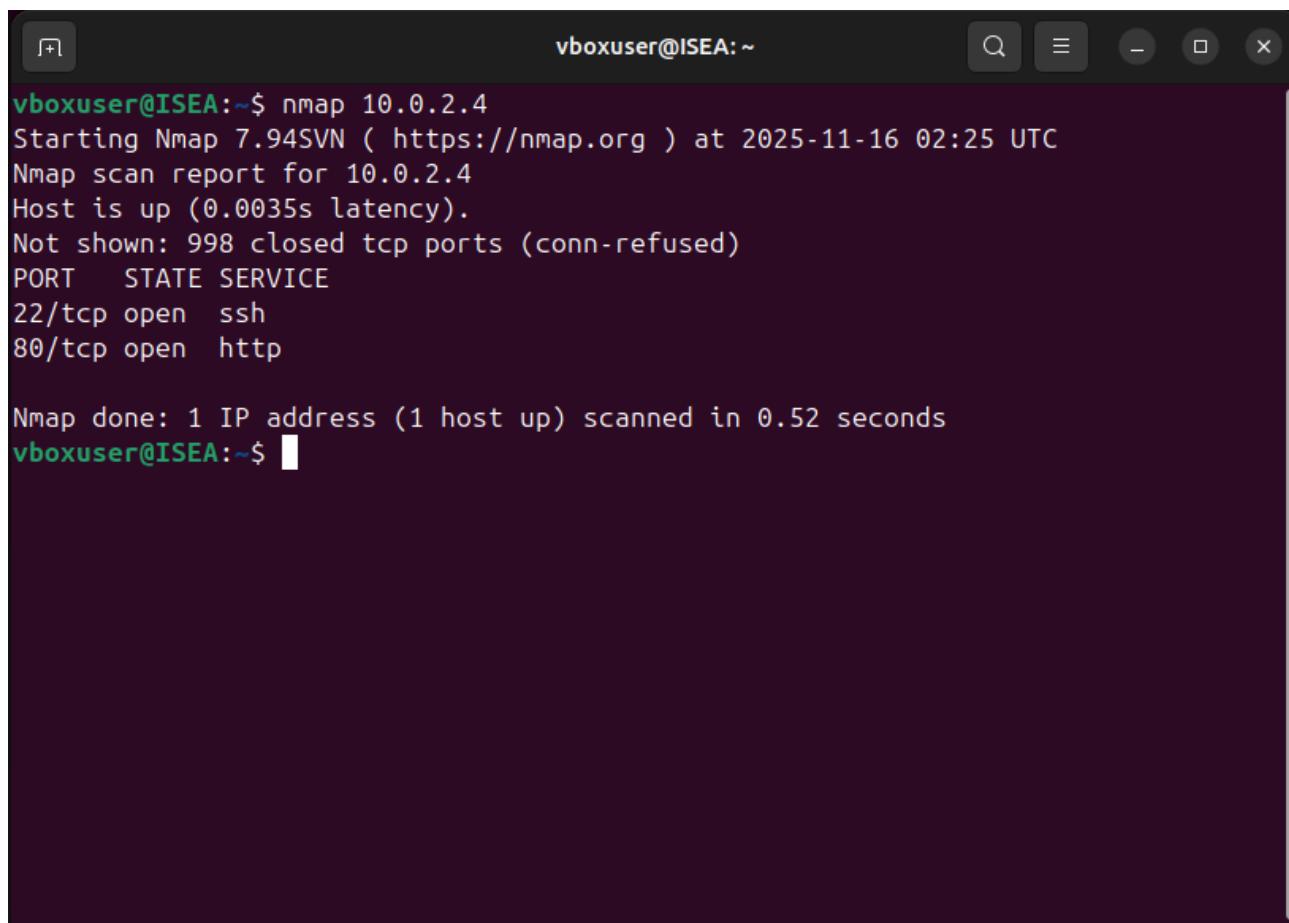
```
#####
#####
```

Cloud Computing:

*As I do not have a credit card, I cannot sign up for AWS, or similar services that require me to enter my credit card information in order to register.

I will start with configuring a firewall (on UFW)

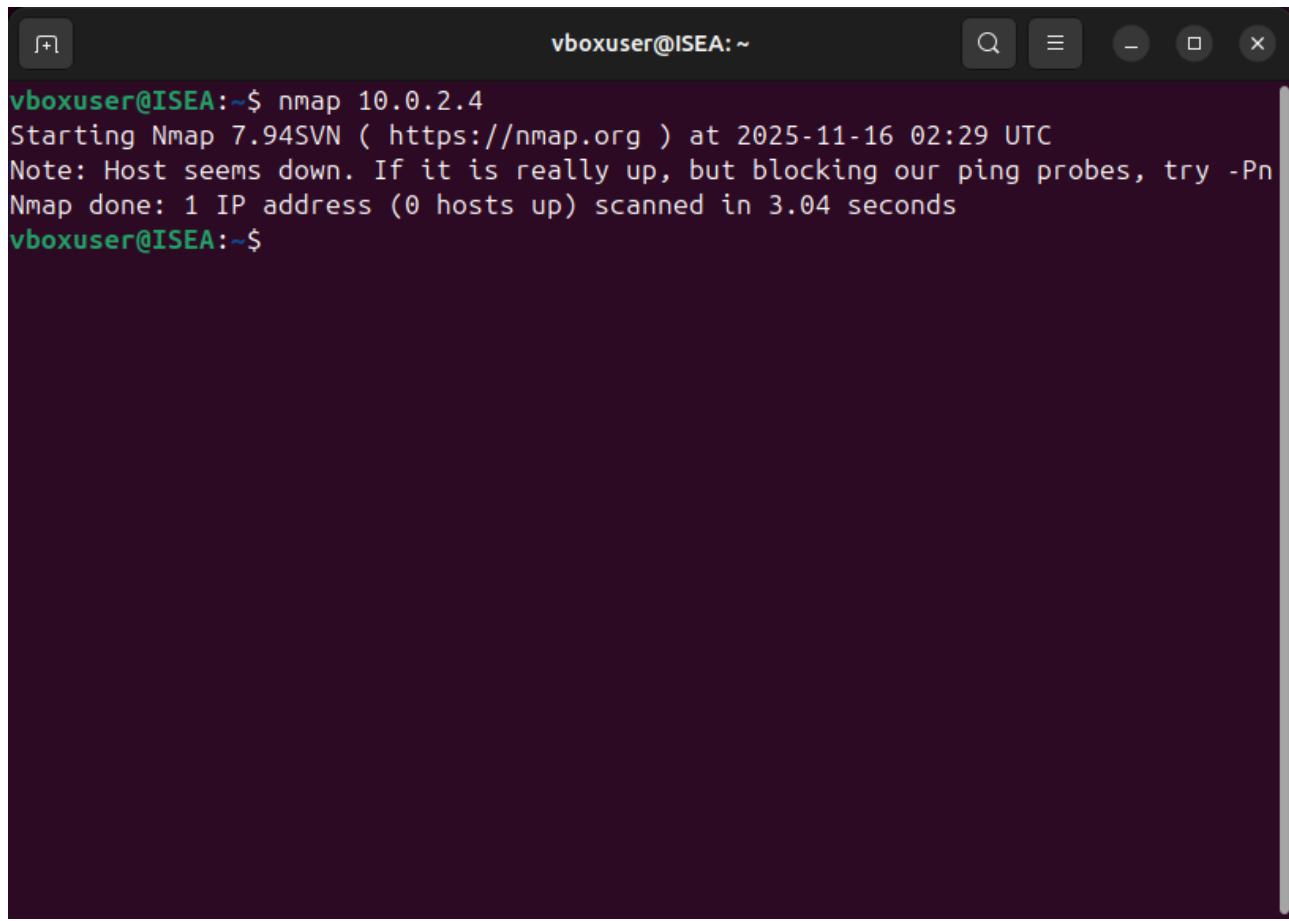
when trying to ping without firewall



vboxuser@ISEA:~\$ nmap 10.0.2.4
Starting Nmap 7.94SVN (https://nmap.org) at 2025-11-16 02:25 UTC
Nmap scan report for 10.0.2.4
Host is up (0.0035s latency).
Not shown: 998 closed tcp ports (conn-refused)
PORT STATE SERVICE
22/tcp open ssh
80/tcp open http

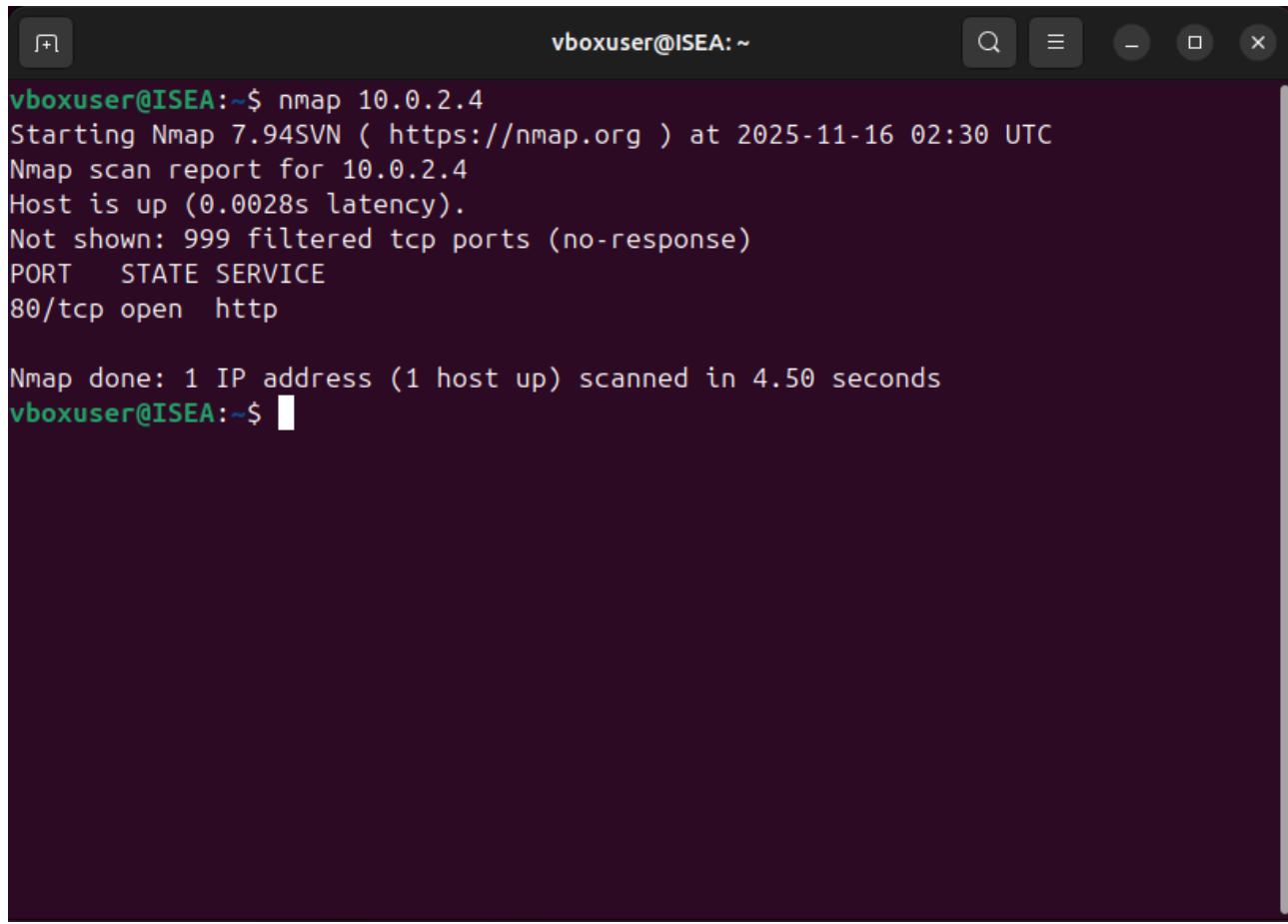
Nmap done: 1 IP address (1 host up) scanned in 0.52 seconds
vboxuser@ISEA:~\$ █

when trying to ping with firewall



vboxuser@ISEA:~\$ nmap 10.0.2.4
Starting Nmap 7.94SVN (https://nmap.org) at 2025-11-16 02:29 UTC
Note: Host seems down. If it is really up, but blocking our ping probes, try -Pn
Nmap done: 1 IP address (0 hosts up) scanned in 3.04 seconds
vboxuser@ISEA:~\$

when trying to ping after giving permission to port 80



vboxuser@ISEA:~\$ nmap 10.0.2.4
Starting Nmap 7.94SVN (https://nmap.org) at 2025-11-16 02:30 UTC
Nmap scan report for 10.0.2.4
Host is up (0.0028s latency).
Not shown: 999 filtered tcp ports (no-response)
PORT STATE SERVICE
80/tcp open http

Nmap done: 1 IP address (1 host up) scanned in 4.50 seconds
vboxuser@ISEA:~\$ █

SSH

*for this section of the lab, I will be executing the SSH from a cloned VM. I have created a new user "test" in the main VM and allowed connection to port 22 in the firewall

when logged in via ssh

vboxuser@ISEA:~\$ ssh test@10.0.2.4
test@10.0.2.4's password:
Welcome to Ubuntu 24.04.3 LTS (GNU/Linux 6.14.0-35-generic x86_64)

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

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

25 additional security updates can be applied with ESM Apps.
Learn more about enabling ESM Apps service at <https://ubuntu.com/esm>

Last login: Fri Nov 14 21:01:40 2025 from 10.0.2.3
test@ISEA:~\$ █

after updating

25 additional security updates can be applied with ESM Apps.
Learn more about enabling ESM Apps service at <https://ubuntu.com/esm>

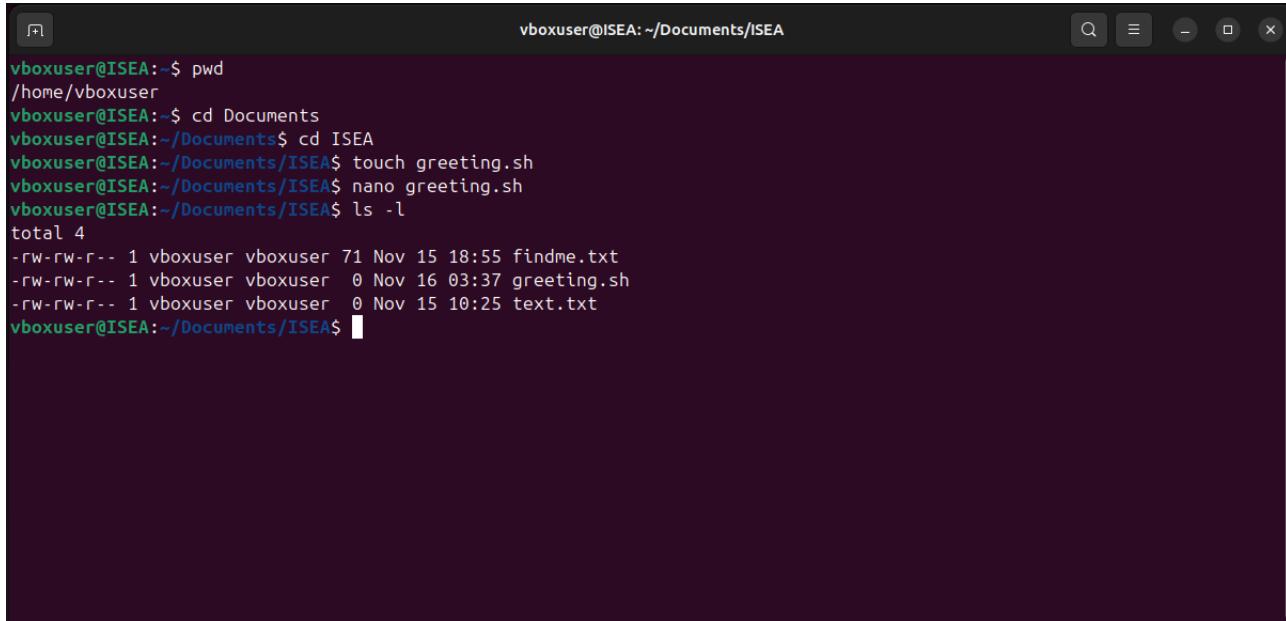
Last login: Sun Nov 16 03:16:54 2025 from 10.0.2.3
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

test@ISEA:~\$ sudo apt update
[sudo] password for test:
Hit:1 https://dl.google.com/linux/chrome/deb stable InRelease
Hit:2 http://sg.archive.ubuntu.com/ubuntu noble InRelease
Hit:3 http://sg.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:4 http://sg.archive.ubuntu.com/ubuntu noble-backports InRelease
Get:5 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:6 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [21.5 kB]
Get:7 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Components [212 B]
Get:8 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [52.3 kB]
Get:9 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Components [212 B]
Fetched 200 kB in 3s (67.5 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
All packages are up to date.
test@ISEA:~\$

BASH Scripting:

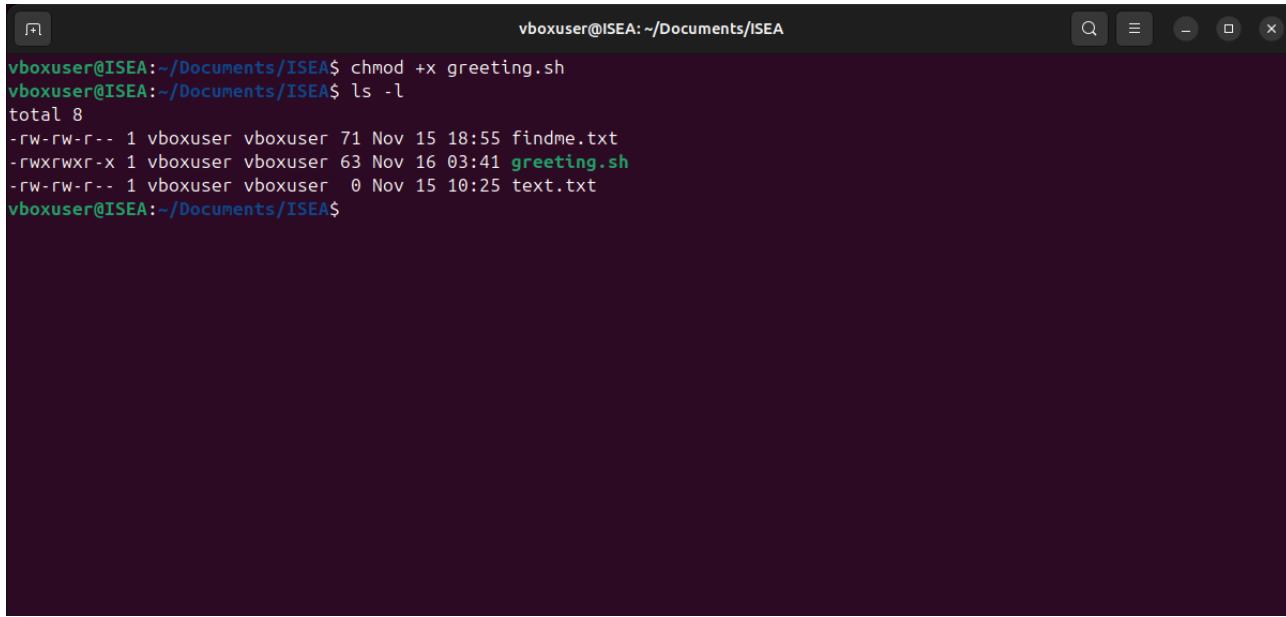
*all scripts will be saved inside ISEA file in documents

creating bash script



```
vboxuser@ISEA:~$ pwd
/home/vboxuser
vboxuser@ISEA:~$ cd Documents
vboxuser@ISEA:~/Documents$ cd ISEA
vboxuser@ISEA:~/Documents/ISEA$ touch greeting.sh
vboxuser@ISEA:~/Documents/ISEA$ nano greeting.sh
vboxuser@ISEA:~/Documents/ISEA$ ls -l
total 4
-rw-rw-r-- 1 vboxuser vboxuser 71 Nov 15 18:55 findme.txt
-rw-rw-r-- 1 vboxuser vboxuser 0 Nov 16 03:37 greeting.sh
-rw-rw-r-- 1 vboxuser vboxuser 0 Nov 15 10:25 text.txt
vboxuser@ISEA:~/Documents/ISEA$
```

converting file into executable



```
vboxuser@ISEA:~/Documents/ISEA$ chmod +x greeting.sh
vboxuser@ISEA:~/Documents/ISEA$ ls -l
total 8
-rw-rw-r-- 1 vboxuser vboxuser 71 Nov 15 18:55 findme.txt
-rwxrwxr-x 1 vboxuser vboxuser 63 Nov 16 03:41 greeting.sh
-rw-rw-r-- 1 vboxuser vboxuser 0 Nov 15 10:25 text.txt
vboxuser@ISEA:~/Documents/ISEA$
```

echo message

The screenshot shows a terminal window titled "vboxuser@ISEA: ~/Documents/ISEA". The command "nano greeting.sh" is run, opening a file in the GNU nano 7.2 editor. The file contains the following code:

```
GNU nano 7.2          greeting.sh
#!/bin/bash

echo "A surprise to be sure, but a welcomed one"
```

The bottom of the terminal shows the nano editor's command bar with various keyboard shortcuts:

- [Read 4 lines]
- ^G Help
- ^O Write Out
- ^W Where Is
- ^K Cut
- ^T Execute
- ^C Location
- ^X Exit
- ^R Read File
- ^\\ Replace
- ^U Paste
- ^J Justify
- ^/ Go To Line

*code

The screenshot shows a terminal window titled "vboxuser@ISEA: ~/Documents/ISEA". The command ". ./greeting.sh" is run, and the output is:

```
vboxuser@ISEA:~/Documents/ISEA$ ./greeting.sh
A surprise to be sure, but a welcomed one
vboxuser@ISEA:~/Documents/ISEA$
```

*output

if else

```
GNU nano 7.2          bigsmall.sh
#!/bin/bash

echo "Number comparer"

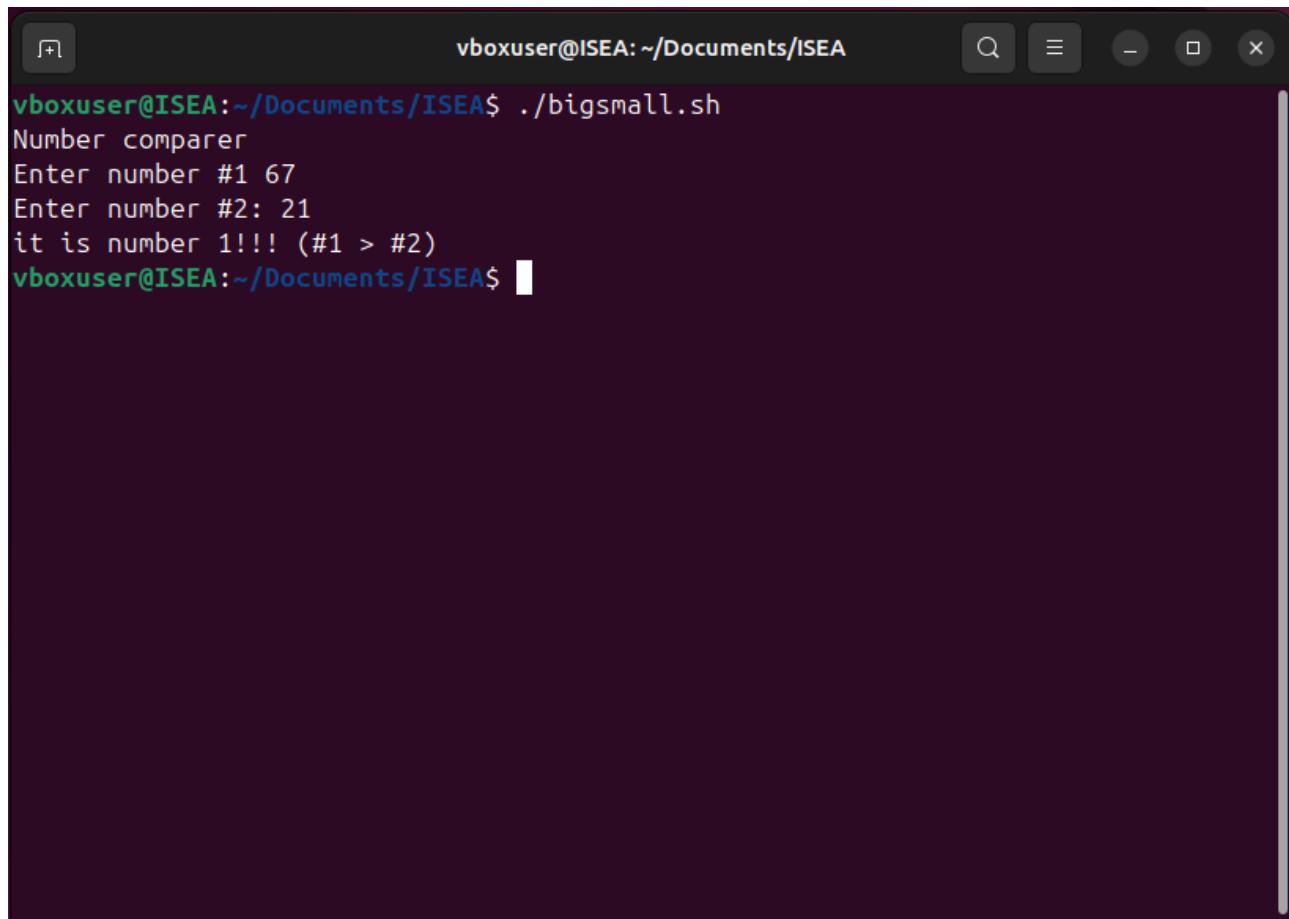
read -p "Enter number #1 " input_a
read -p "Enter number #2: " input_b

if (( $input_a < $input_b )); then
    echo "it is not number 1 ;-; (#2 > #1)"
else
    echo "it is number 1!!! (#1 > #2)"
fi
```

[Read 13 lines]

^G Help **^O** Write Out **^W** Where Is **^K** Cut **^T** Execute **^C** Location
^X Exit **^R** Read File **^** Replace **^U** Paste **^J** Justify **^/** Go To Line

*code



A screenshot of a terminal window titled "vboxuser@ISEA: ~/Documents/ISEA". The window contains the following text:

```
vboxuser@ISEA:~/Documents/ISEA$ ./bigs small.sh
Number comparer
Enter number #1 67
Enter number #2: 21
it is number 1!!! (#1 > #2)
vboxuser@ISEA:~/Documents/ISEA$
```

*output

for loop

GNU nano 7.2 onefive.sh

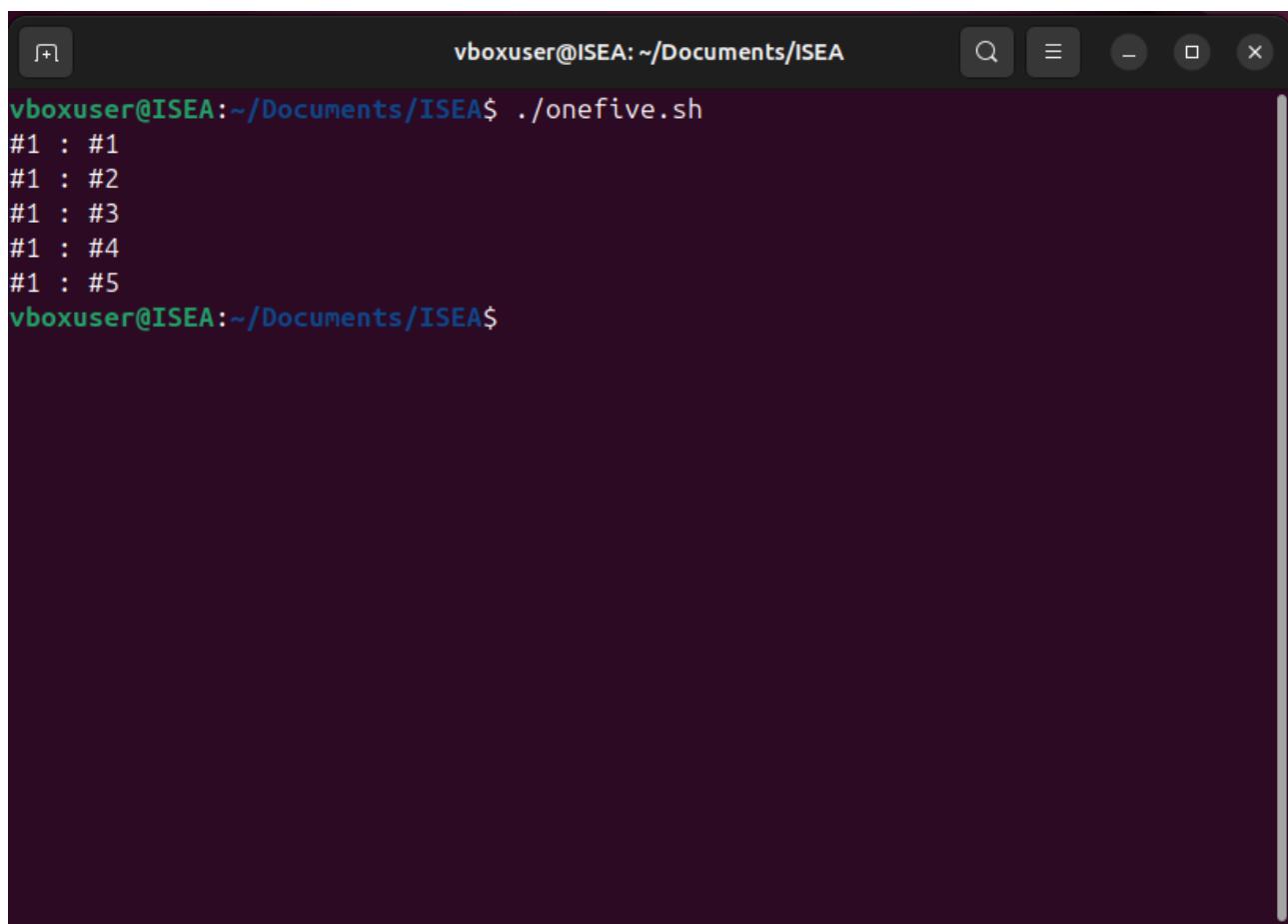
```
#!/bin/bash

for i in {1..5}; do
    echo "#$1 : #\$i"
done
```

[Read 5 lines]

^G Help **^O** Write Out **^W** Where Is **^K** Cut **^T** Execute **^C** Location
^X Exit **^R** Read File **^** Replace **^U** Paste **^J** Justify **^/** Go To Line

*code

A screenshot of a terminal window titled "vboxuser@ISEA: ~/Documents/ISEA". The window shows the command ". ./onefive.sh" being run, followed by five lines of output: "#1 : #1", "#1 : #2", "#1 : #3", "#1 : #4", and "#1 : #5". The terminal has a dark background and light-colored text. The title bar includes standard window controls (minimize, maximize, close) and a search icon.

*output

while loop

The screenshot shows a terminal window titled "jumping.sh" with the command "GNU nano 7.2" at the top. The script content is as follows:

```
#!/bin/bash

jump=0

echo "Johnny is jumping on the bed"

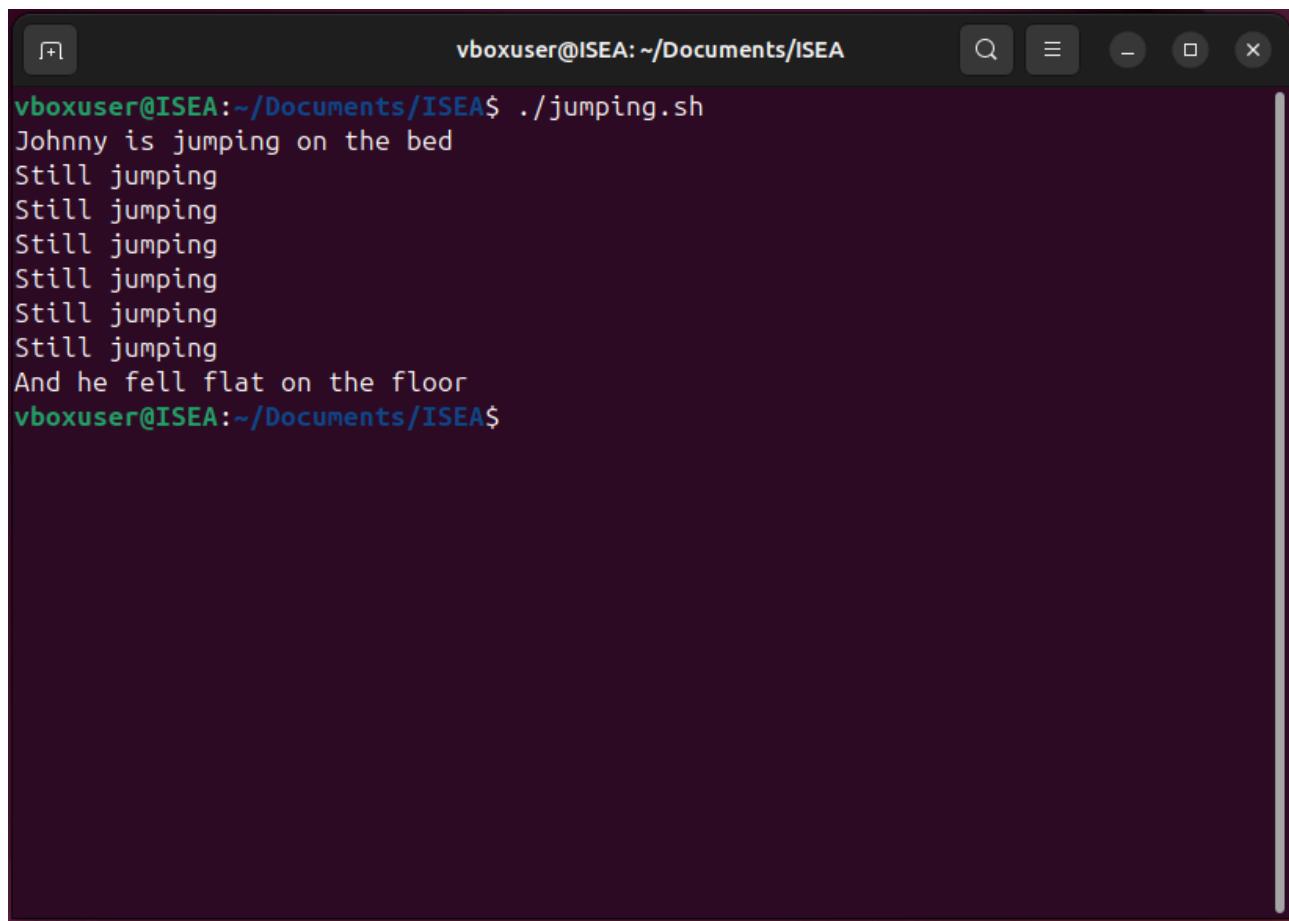
while [ $jump -le 5 ]; do
    echo "Still jumping"
    jump=$((jump + 1))
    sleep 1s
done

echo "And he fell flat on the floor"
```

At the bottom of the terminal window, there is a menu bar with the following options:

- [Read 13 lines]
- ^G Help
- ^O Write Out
- ^W Where Is
- ^K Cut
- ^T Execute
- ^C Location
- ^X Exit
- ^R Read File
- ^\\ Replace
- ^U Paste
- ^J Justify
- ^/ Go To Line

*code

A screenshot of a terminal window titled "vboxuser@ISEA: ~/Documents/ISEA". The window contains the following text:

```
vboxuser@ISEA:~/Documents/ISEA$ ./jumping.sh
Johnny is jumping on the bed
Still jumping
And he fell flat on the floor
vboxuser@ISEA:~/Documents/ISEA$
```

The terminal has a dark background with light-colored text. It includes standard window controls (minimize, maximize, close) in the top right corner.

*output

for cron

crontab file:

```

GNU nano 7.2                               /etc/crontab
# /etc/crontab: system-wide crontab
# Unlike any other crontab you don't have to run the `crontab`
# command to install the new version when you edit this file
# and files in /etc/cron.d. These files also have username fields,
# that none of the other crontabs do.

SHELL=/bin/sh
# You can also override PATH, but by default, newer versions inherit it from th>
#PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin

# Example of job definition:
# .----- minute (0 - 59)
# | .----- hour (0 - 23)
# | | .----- day of month (1 - 31)
# | | | .---- month (1 - 12) OR jan,feb,mar,apr ...
# | | | | .--- day of week (0 - 6) (Sunday=0 or 7) OR sun,mon,tue,wed,thu,>
# | | | |
# * * * * * user-name command to be executed
17 *      * * *    root     cd / && run-parts --report /etc/cron.hourly
25 6      * * *    root     test -x /usr/sbin/anacron || { cd / && run-parts --repo>

^G Help      ^O Write Out ^W Where Is  ^K Cut      ^T Execute   ^C Location
^X Exit      ^R Read File ^\ Replace   ^U Paste    ^J Justify   ^/ Go To Line

```

*in the 1st cron rule/setting, the script will run on the 17th min of every hour

when i want to run the script, i can use "bash" or "./". chmod simply only remove/add permissions to the file to user groups (default is editing permissions to all user groups)

output

```
#####
#####
```

Session 3 - AM

```
#####
#####
```

As i do not have a credit card, there is nothing i can show for both labs in this session

(both are reliant on AWS).

```
#####
#####
```

Session 3 - PM

```
#####
#####
```

Scripting Linux Server Functions:

*source directory for backups would be ISEA, and the target directory would be ISEA_BP

script

The screenshot shows a terminal window titled "vboxuser@ISEA: ~/Documents/ISEA". The window title bar includes standard icons for minimize, maximize, and close. The terminal itself displays a nano editor session for a file named "/usr/bin/backup.sh". The content of the file is as follows:

```
GNU nano 7.2          /usr/bin/backup.sh
#!/bin/bash

cp -r /home/vboxuser/Documents/ISEA/. /home/vboxuser/Documents/ISEA_BP
```

At the bottom of the terminal, there is a status bar with the message "[Read 4 lines]". Below this, a series of keyboard shortcuts are listed:

$\wedge G$ Help	$\wedge O$ Write Out	$\wedge W$ Where Is	$\wedge K$ Cut	$\wedge T$ Execute	$\wedge C$ Location
$\wedge X$ Exit	$\wedge R$ Read File	$\wedge \backslash$ Replace	$\wedge U$ Paste	$\wedge J$ Justify	$\wedge /$ Go To Line

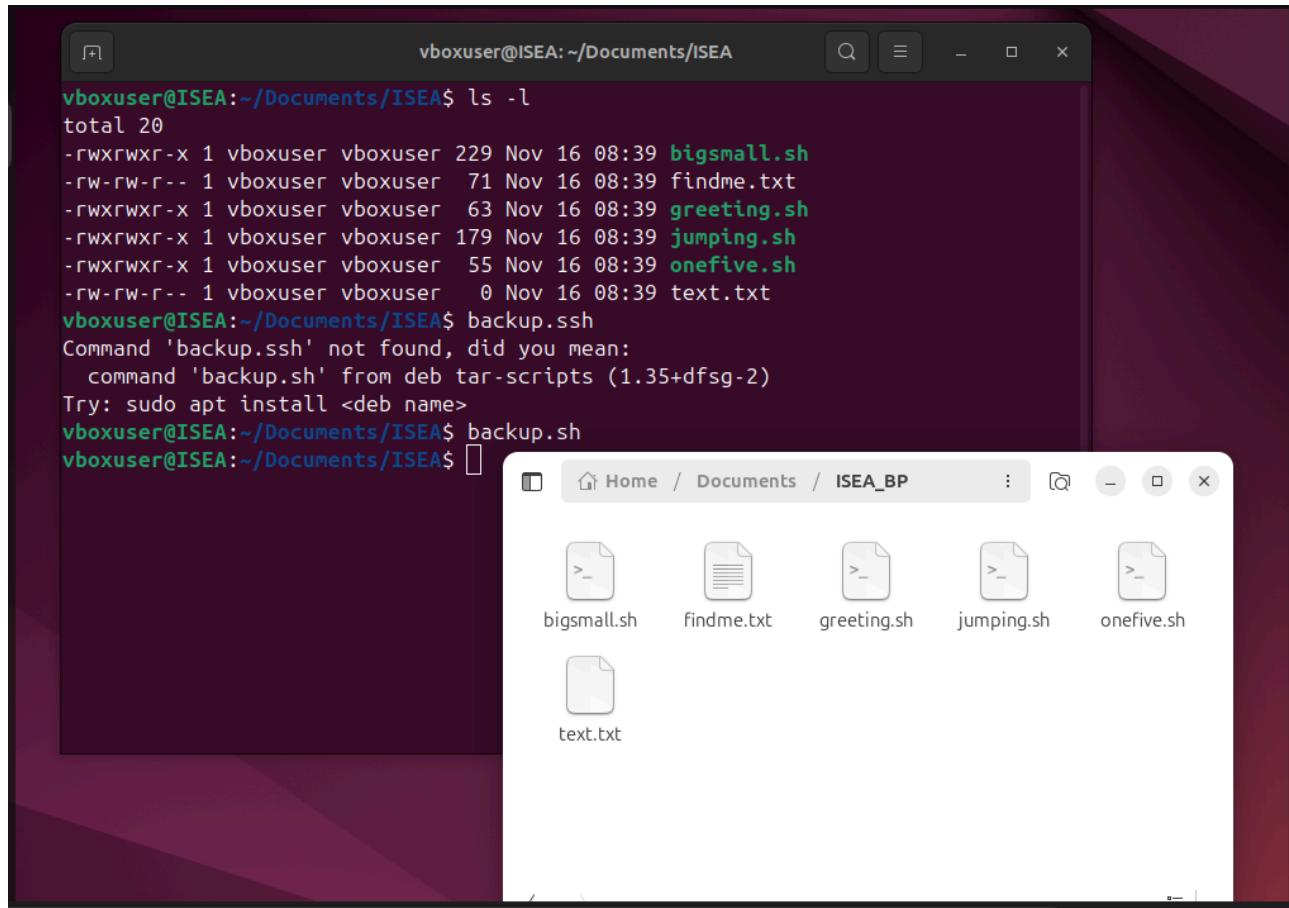
*file has been moved to a common folder for ease of access

before backup

vboxuser@ISEA:~/Documents/ISEA\$ ls -l
total 20
-rwxrwxr-x 1 vboxuser vboxuser 229 Nov 16 08:39 **bigsmall.sh**
-rw-rw-r-- 1 vboxuser vboxuser 71 Nov 16 08:39 findme.txt
-rwxrwxr-x 1 vboxuser vboxuser 63 Nov 16 08:39 **greeting.sh**
-rwxrwxr-x 1 vboxuser vboxuser 179 Nov 16 08:39 **jumping.sh**
-rwxrwxr-x 1 vboxuser vboxuser 55 Nov 16 08:39 **onefive.sh**
-rw-rw-r-- 1 vboxuser vboxuser 0 Nov 16 08:39 text.txt
vboxuser@ISEA:~/Documents/ISEA\$

The terminal window shows a list of files in the current directory. The file names are bolded. The file manager window shows a single folder icon with the text "Folder is Empty" below it. The path in the file manager is Home / Documents / ISEA_BP.

after backup



The screenshot shows a Linux desktop environment. In the top-left corner, there is a terminal window titled "vboxuser@ISEA: ~/Documents/ISEA". The terminal displays the output of the command "ls -l", which lists several files: bigsmall.sh, findme.txt, greeting.sh, jumping.sh, onefive.sh, and text.txt. It also shows an error message for the command "backup.ssh" and a suggestion to install "backup.sh". In the bottom-right corner, there is a file manager window titled "ISEA_BP". The window shows the same six files listed in the terminal, each represented by a small icon.

```
vboxuser@ISEA:~/Documents/ISEA$ ls -l
total 20
-rwxrwxr-x 1 vboxuser vboxuser 229 Nov 16 08:39 bigsmall.sh
-rw-rw-r-- 1 vboxuser vboxuser 71 Nov 16 08:39 findme.txt
-rwxrwxr-x 1 vboxuser vboxuser 63 Nov 16 08:39 greeting.sh
-rwxrwxr-x 1 vboxuser vboxuser 179 Nov 16 08:39 jumping.sh
-rwxrwxr-x 1 vboxuser vboxuser 55 Nov 16 08:39 onefive.sh
-rw-rw-r-- 1 vboxuser vboxuser 0 Nov 16 08:39 text.txt
vboxuser@ISEA:~/Documents/ISEA$ backup.ssh
Command 'backup.ssh' not found, did you mean:
  command 'backup.sh' from deb tar-scripts (1.35+dfsg-2)
Try: sudo apt install <deb name>
vboxuser@ISEA:~/Documents/ISEA$ backup.sh
vboxuser@ISEA:~/Documents/ISEA$
```

using cron to schedule when does script run (i will run the backup script once every 2 mins)

code change (to produce an output)

The screenshot shows a terminal window titled "vboxuser@ISEA: ~/Documents". The command being run is "nano 7.2 /usr/bin/backup.sh". The script contains the following commands:

```
GNU nano 7.2
#!/bin/bash

cp -r /home/vboxuser/Documents/ISEA/. /home/vboxuser/Documents/ISEA_BP

ls /home/vboxuser/Documents/ISEA_BP -l
```

The terminal interface includes a status bar at the bottom with various keyboard shortcuts for nano editor functions like Help, Write Out, Where Is, Cut, Paste, Execute, Location, Undo, Exit, Read File, Replace, Justify, Go To Line, and Redo.

crontab

The screenshot shows a terminal window titled "vboxuser@ISEA: ~/Documents". The command being run is "nano 7.2 /etc/crontab". The crontab file contains the following cron job definitions:

```
GNU nano 7.2
/etc/crontab
# that none of the other crontabs do.

SHELL=/bin/sh
# You can also override PATH, but by default, newer versions inherit it from the environment
#PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin

# Example of job definition:
# ----- minute (0 - 59)
# | .----- hour (0 - 23)
# | | .---- day of month (1 - 31)
# | | | .--- month (1 - 12) OR jan,feb,mar,apr ...
# | | | | .-- day of week (0 - 6) (Sunday=0 or 7) OR sun,mon,tue,wed,thu,fri,sat
# | | | |
# * * * * * user-name command to be executed
17 * * * * root    cd / && run-parts --report /etc/cron.hourly
25 6 * * * root    test -x /usr/sbin/anacron || { cd / && run-parts --report /etc/cron.daily; }
47 6 * * 7 root    test -x /usr/sbin/anacron || { cd / && run-parts --report /etc/cron.weekly; }
52 6 1 * * root    test -x /usr/sbin/anacron || { cd / && run-parts --report /etc/cron.monthly; }
* * * * * root    /usr/bin/backup.sh | tail -3 >> /home/vboxuser/Documents/cron_log.log
#
```

The terminal interface includes a status bar at the bottom with various keyboard shortcuts for nano editor functions like Help, Write Out, Where Is, Cut, Paste, Execute, Location, Undo, Exit, Read File, Replace, Justify, Go To Line, and Redo.

log

The screenshot shows a terminal window titled "cron_log.log" located in the "Documents" folder. A prominent orange banner at the top states "File Has Changed on Disk" and "The file has been changed by another program." with a "Discard Changes and Reload" button. The terminal displays a list of files with their permissions, last modified date, and names. Several entries show redacted file names (e.g., "onefive.sh") and file sizes (e.g., "55").

```
-rwxr-xr-x 1 root root 179 Nov 16 09:54 jumping.sh  
-rwxr-xr-x 1 root root 55 Nov 16 09:54 onefive.sh  
-rw-r--r-- 1 root root 0 Nov 16 09:54 text.txt  
-rwxr-xr-x 1 root root 179 Nov 16 09:55 jumping.sh  
-rwxr-xr-x 1 root root 55 Nov 16 09:55 onefive.sh  
-rw-r--r-- 1 root root 0 Nov 16 09:55 text.txt
```

*log directory is in Documents

**log was updated whilst i was taking a screenshot

```
#####
#####
```

Session 4a - AM

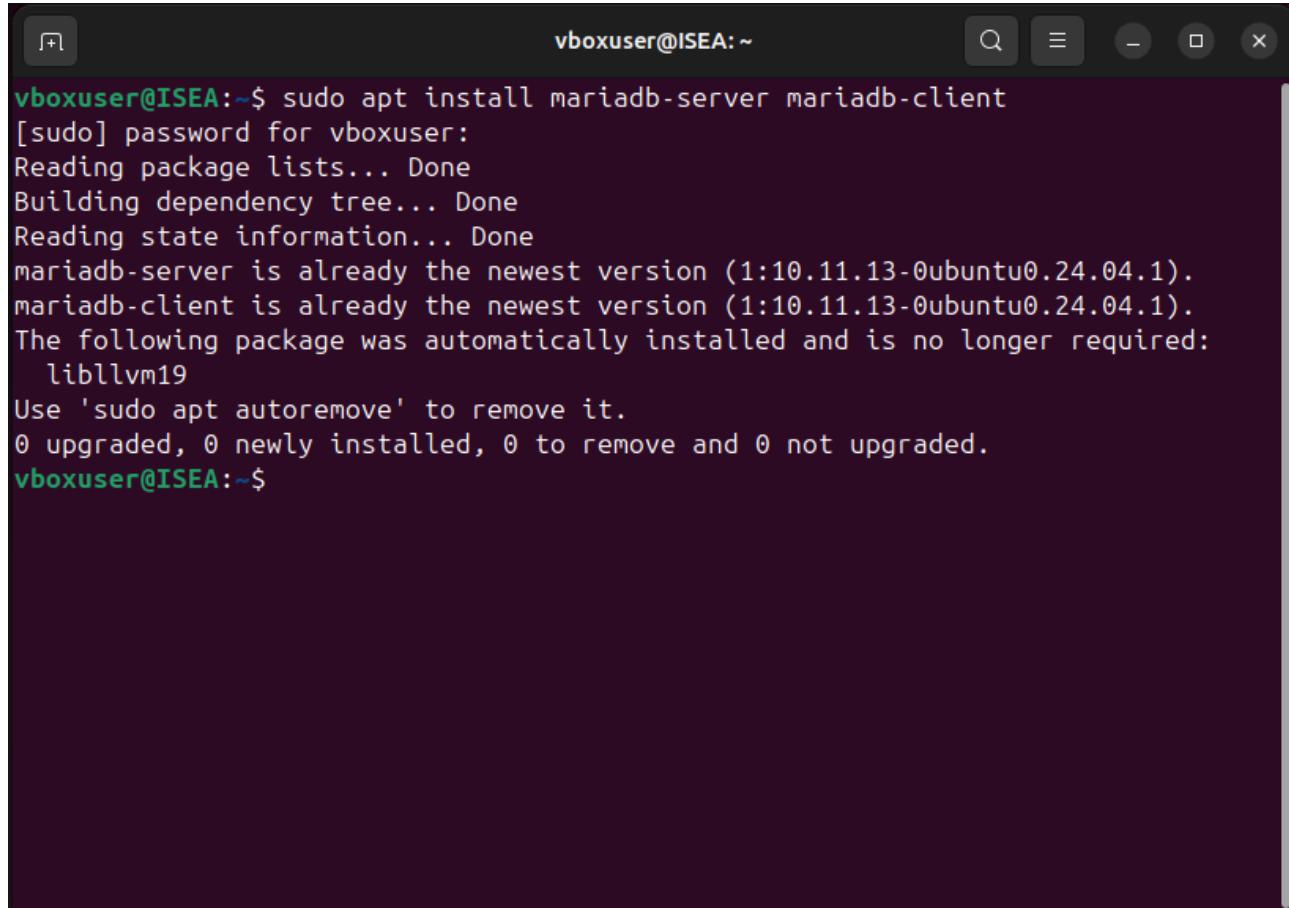
```
#####
#####
```

Using MariaDB:

As I do not have an AWS account, remote access to the MariaDB server will be done via ssh.

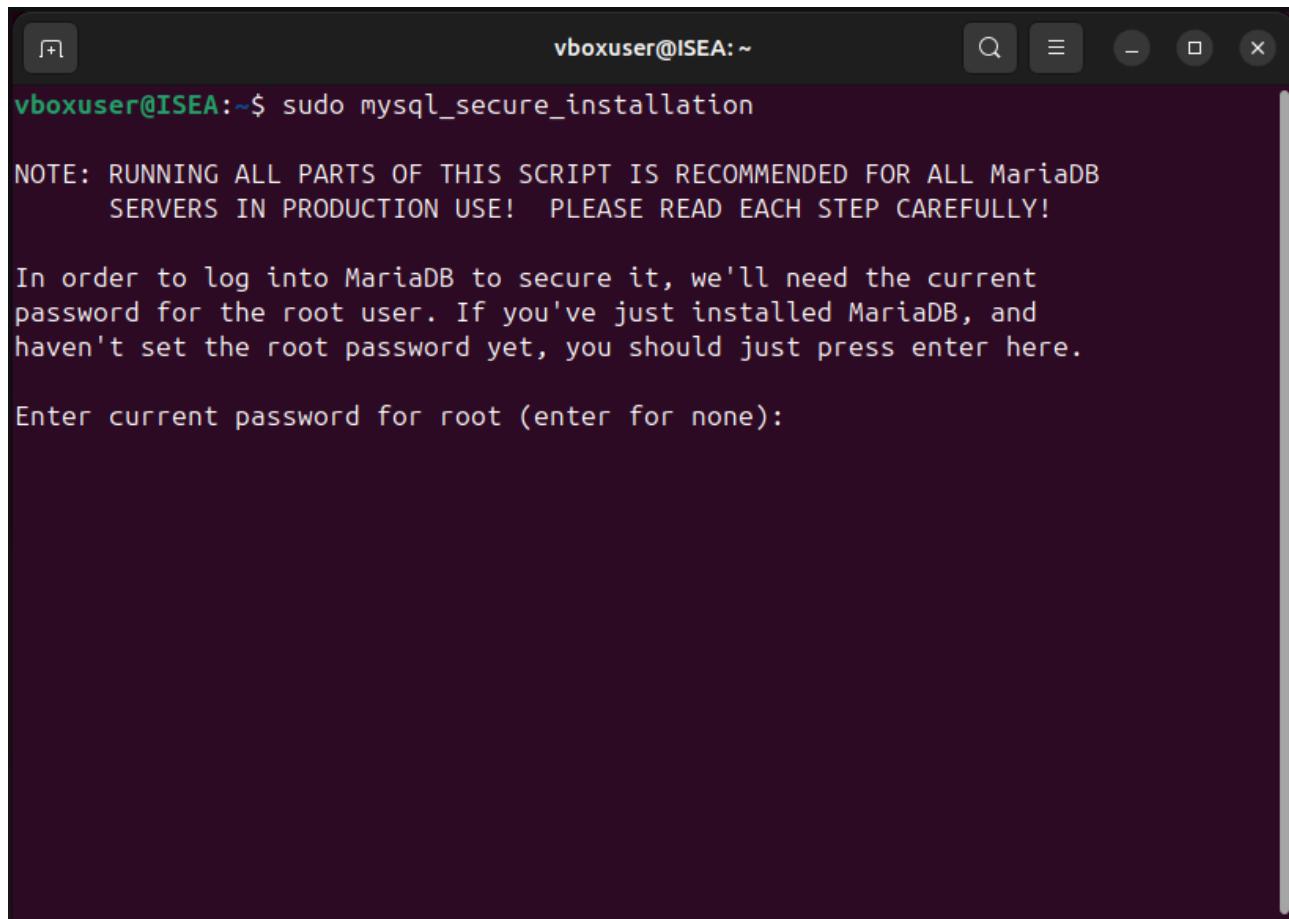
The goals I have set is to create a user account (and a password for account), create/delete databases, create/delete tables and adding/deleting data to table on one VM (Virtual Machine), and seeing the changes in another VM

To install MariaDB:



```
vboxuser@ISEA:~$ sudo apt install mariadb-server mariadb-client
[sudo] password for vboxuser:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
mariadb-server is already the newest version (1:10.11.13-0ubuntu0.24.04.1).
mariadb-client is already the newest version (1:10.11.13-0ubuntu0.24.04.1).
The following package was automatically installed and is no longer required:
  liblvm19
Use 'sudo apt autoremove' to remove it.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
vboxuser@ISEA:~$
```

To setup MariaDB (and root account):



vboxuser@ISEA:~\$ sudo mysql_secure_installation

NOTE: RUNNING ALL PARTS OF THIS SCRIPT IS RECOMMENDED FOR ALL MariaDB SERVERS IN PRODUCTION USE! PLEASE READ EACH STEP CAREFULLY!

In order to log into MariaDB to secure it, we'll need the current password for the root user. If you've just installed MariaDB, and haven't set the root password yet, you should just press enter here.

Enter current password for root (enter for none):

*root account password can be changed in this step.

To login to MariaDB:

A screenshot of a terminal window titled "vboxuser@ISEA:~". The window contains the following text:

```
vboxuser@ISEA:~$ mariadb -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 33
Server version: 10.11.13-MariaDB-0ubuntu0.24.04.1 Ubuntu 24.04

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

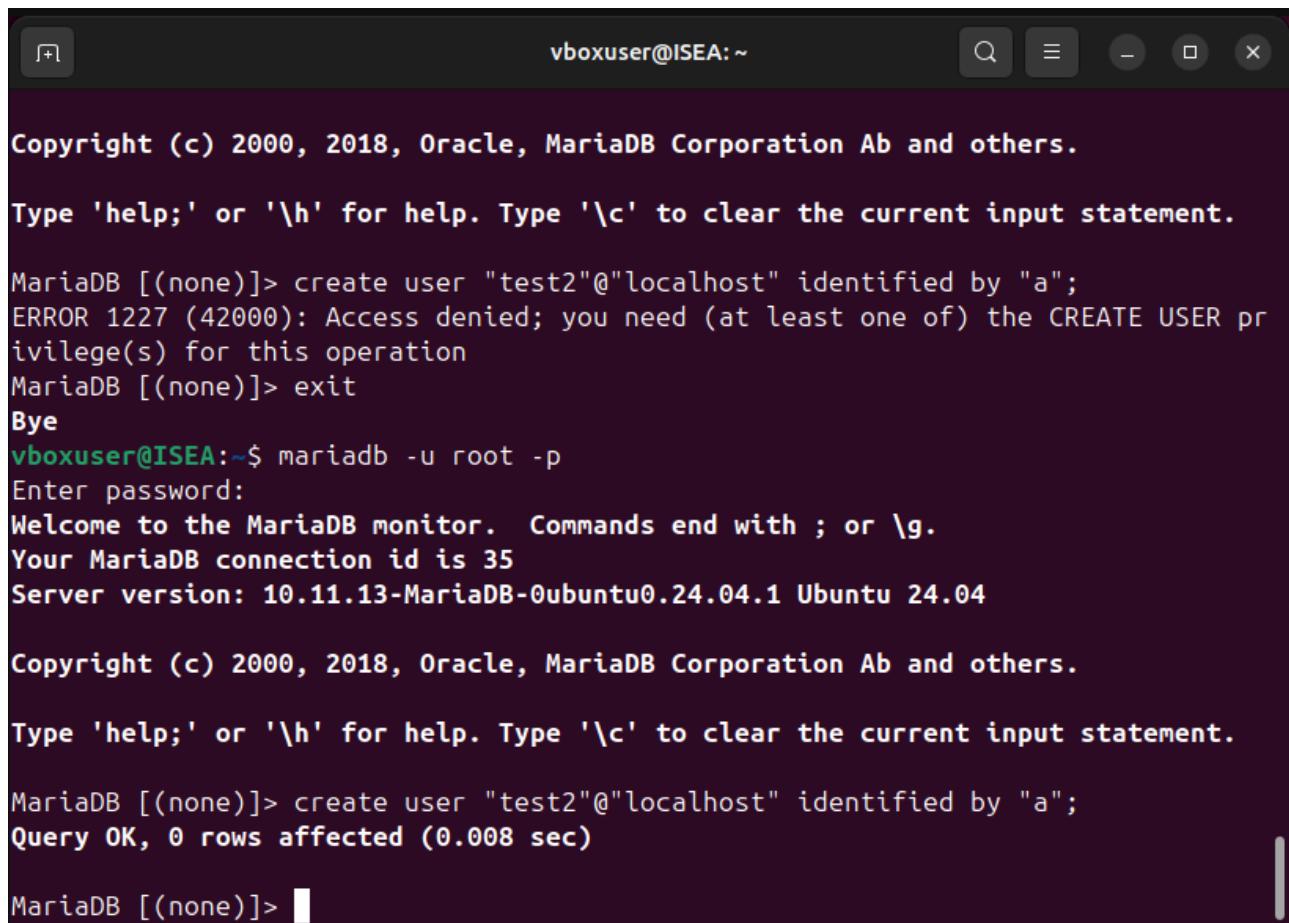
MariaDB [(none)]>
```

*note that root account is needed for 1st time as no user account has been made (will login as root/admin)

** replace "root" with username if account has been made already

*** sudo can be used to bypass password requirement

To create a new user (username = test2, password = a):



vboxuser@ISEA: ~

```
Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> create user "test2"@"localhost" identified by "a";
ERROR 1227 (42000): Access denied; you need (at least one of) the CREATE USER privilege(s) for this operation
MariaDB [(none)]> exit
Bye
vboxuser@ISEA:~$ mariadb -u root -p
Enter password:
Welcome to the MariaDB monitor. Commands end with ; or \g.
Your MariaDB connection id is 35
Server version: 10.11.13-MariaDB-0ubuntu0.24.04.1 Ubuntu 24.04

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> create user "test2"@"localhost" identified by "a";
Query OK, 0 rows affected (0.008 sec)

MariaDB [(none)]>
```

*you can replace "test2" with desired username, and "a" with desired password

To delete user (test2):

```
vboxuser@ISEA:~
```

```
Welcome to the MariaDB monitor. Commands end with ; or \g.
Your MariaDB connection id is 35
Server version: 10.11.13-MariaDB-0ubuntu0.24.04.1 Ubuntu 24.04

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> create user "test2"@"localhost" identified by "a";
Query OK, 0 rows affected (0.008 sec)

MariaDB [(none)]> select user, host from mysql.user;
+-----+-----+
| User      | Host     |
+-----+-----+
| mariadb.sys | localhost |
| mysql      | localhost |
| root       | localhost |
| test        | localhost |
| test2       | localhost |
+-----+-----+
5 rows in set (0.001 sec)

MariaDB [(none)]>
```

*user list before deleting

```
vboxuser@ISEA:~
```

```
+-----+-----+
| mariadb.sys | localhost |
| mysql      | localhost |
| root       | localhost |
| test        | localhost |
| test2       | localhost |
+-----+-----+
5 rows in set (0.001 sec)

MariaDB [(none)]> drop user "test2"@"localhost";
Query OK, 0 rows affected (0.010 sec)

MariaDB [(none)]> select user, host from mysql.user;
+-----+-----+
| User      | Host     |
+-----+-----+
| mariadb.sys | localhost |
| mysql      | localhost |
| root       | localhost |
| test        | localhost |
+-----+-----+
4 rows in set (0.002 sec)

MariaDB [(none)]>
```

*user list after deleting

To create database:

before creating



```
vboxuser@ISEA: ~
MariaDB [(none)]> show databases;
+-----+
| Database      |
+-----+
| ISEA_Test    |
| information_schema |
| mysql         |
| performance_schema |
| sys           |
+-----+
5 rows in set (0.001 sec)

MariaDB [(none)]>
```

after creating

```
vboxuser@ISEA: ~
+-----+
| information_schema |
| mysql               |
| performance_schema |
| sys                 |
+-----+
5 rows in set (0.001 sec)

MariaDB [(none)]> create database ISEA_Test2;
Query OK, 1 row affected (0.000 sec)

MariaDB [(none)]> show databases;
+-----+
| Database      |
+-----+
| ISEA_Test     |
| ISEA_Test2    |
| information_schema |
| mysql          |
| performance_schema |
| sys            |
+-----+
6 rows in set (0.004 sec)

MariaDB [(none)]>
```

To delete database (deleting ISEA_Test2):

```
vboxuser@ISEA: ~
+-----+
| Database      |
+-----+
| ISEA_Test     |
| ISEA_Test2    |
| information_schema |
| mysql          |
| performance_schema |
| sys            |
+-----+
6 rows in set (0.000 sec)

MariaDB [(none)]> drop database ISEA_Test2;
Query OK, 0 rows affected (0.015 sec)

MariaDB [(none)]> show databases;
+-----+
| Database      |
+-----+
| ISEA_Test     |
| information_schema |
| mysql          |
| performance_schema |
| sys            |
+-----+
```

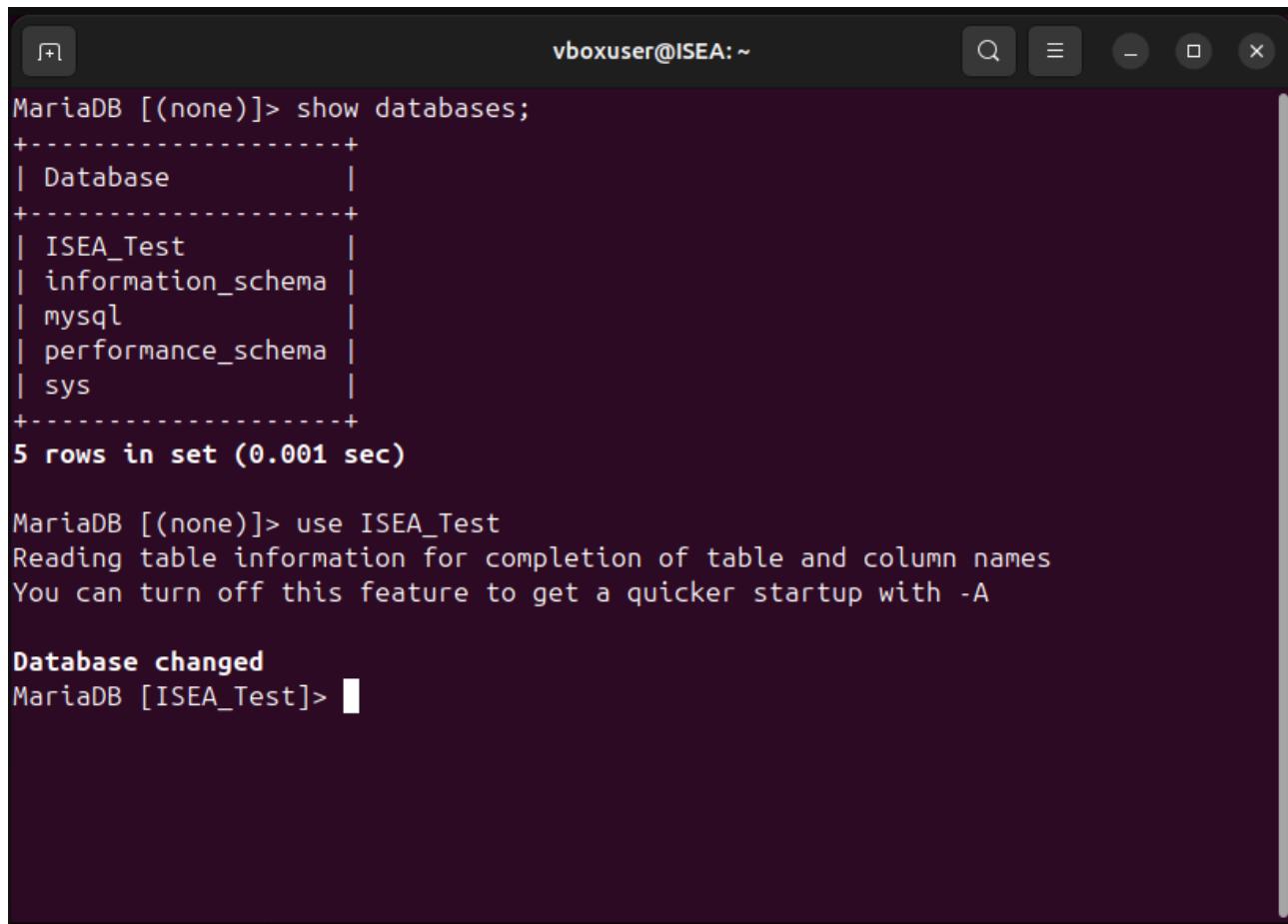
*note that to delete database, permissions must be given to account, else only root account can delete them

To create table (in database):

Entering a database (similar to cd in linux console)

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Preview Code Blame Raw ↻ ↽ ⌂



The screenshot shows a terminal window titled "vboxuser@ISEA:~". The user is connected to a MariaDB database. The first command entered is "show databases;". The output lists several databases: ISEA_Test, information_schema, mysql, performance_schema, and sys. A message indicates there are 5 rows in the set. The next command is "use ISEA_Test", which changes the database context. A message follows stating that table information is being read for completion, and the user can turn off this feature with the -A option. The final message is "Database changed".

```
MariaDB [(none)]> show databases;
+-----+
| Database      |
+-----+
| ISEA_Test    |
| information_schema |
| mysql         |
| performance_schema |
| sys           |
+-----+
5 rows in set (0.001 sec)

MariaDB [(none)]> use ISEA_Test
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
MariaDB [ISEA_Test]>
```

*this step is not needed to create a table if you define which database you want to create the table in

create table (auto index 1st coloumn, text for 2nd coloumn)

```
vboxuser@ISEA:~
```

```
5 rows in set (0.001 sec)

MariaDB [(none)]> use ISEA_Test
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
MariaDB [ISEA_Test]> create table ISEA_Text (
    -> id int primary key auto_increment,
    -> Test text not null
    -> );
Query OK, 0 rows affected (0.032 sec)

MariaDB [ISEA_Test]> describe ISEA_Text
    -> ;
+-----+-----+-----+-----+-----+
| Field | Type   | Null | Key | Default | Extra       |
+-----+-----+-----+-----+-----+
| id    | int(11) | NO   | PRI | NULL    | auto_increment |
| Test  | text    | NO   |     | NULL    |             |
+-----+-----+-----+-----+-----+
2 rows in set (0.008 sec)

MariaDB [ISEA_Test]>
```

table view

```
vboxuser@ISEA:~ -> ;  
+----+-----+-----+-----+-----+  
| Field | Type   | Null | Key | Default | Extra          |  
+----+-----+-----+-----+-----+  
| id   | int(11) | NO   | PRI  | NULL    | auto_increment |  
| Test  | text    | NO   |      | NULL    |                 |  
+----+-----+-----+-----+-----+  
2 rows in set (0.008 sec)  
  
MariaDB [ISEA_Test]> create table ISEA_TestDel ( id int primary key auto_increment, Test text not null );  
Query OK, 0 rows affected (0.019 sec)  
  
MariaDB [ISEA_Test]> show tables;  
+-----+  
| Tables_in_ISEA_Test |  
+-----+  
| ISEA_TestDel       |  
| ISEA_Text          |  
| TestIndex          |  
+-----+  
3 rows in set (0.000 sec)  
  
MariaDB [ISEA_Test]>
```

To delete table:

```
vboxuser@ISEA: ~
+-----+
| ISEA_TestDel      |
| ISEA_Text          |
| TestIndex          |
+-----+
3 rows in set (0.005 sec)

MariaDB [ISEA_Test]> drop table TestIndex
-> ;
Query OK, 0 rows affected (0.018 sec)

MariaDB [ISEA_Test]> drop table ISEA_TestDel;
Query OK, 0 rows affected (0.017 sec)

MariaDB [ISEA_Test]> show tables
-> ;
+-----+
| Tables_in_ISEA_Test |
+-----+
| ISEA_Text           |
+-----+
1 row in set (0.000 sec)

MariaDB [ISEA_Test]> █
```

To add data (adding a famous line from a sci-fi movie :D):

```
vboxuser@ISEA: ~
+-----+
1 row in set (0.000 sec)

MariaDB [ISEA_Test]> describe ISEA_Text;
+-----+-----+-----+-----+-----+
| Field | Type   | Null | Key | Default | Extra      |
+-----+-----+-----+-----+-----+
| id    | int(11) | NO   | PRI  | NULL    | auto_increment |
| Test  | text    | NO   |       | NULL    |             |
+-----+-----+-----+-----+-----+
2 rows in set (0.004 sec)

MariaDB [ISEA_Test]> insert into ISEA_Text (test) values ("Hello There");
Query OK, 1 row affected (0.005 sec)

MariaDB [ISEA_Test]> select * from ISEA_Text;
+-----+
| id | Test      |
+-----+
| 1  | Hello There |
+-----+
1 row in set (0.000 sec)

MariaDB [ISEA_Test]>
```

```
vboxuser@ISEA: ~
+-----+
1 row in set (0.000 sec)

MariaDB [ISEA_Test]> insert into ISEA_Text (test) values ("Hello There");
Query OK, 1 row affected (0.005 sec)

MariaDB [ISEA_Test]> select * from ISEA_Text;
+-----+
| id | Test      |
+-----+
| 1  | Hello There |
+-----+
1 row in set (0.000 sec)

MariaDB [ISEA_Test]> insert into ISEA_Text (test) values ("General Kenobi");
Query OK, 1 row affected (0.005 sec)

MariaDB [ISEA_Test]> select * from ISEA_Text;
+-----+
| id | Test      |
+-----+
| 1  | Hello There |
| 2  | General Kenobi |
+-----+
2 rows in set (0.000 sec)

MariaDB [ISEA_Test]>
```

*data entry must match what data type is expected when creating the table

To delete data (removing data with id 2):

```
vboxuser@ISEA:~ MariaDB [ISEA_Test]> insert into ISEA_Text (test) values ("General Kenobi");
Query OK, 1 row affected (0.005 sec)

MariaDB [ISEA_Test]> select * from ISEA_Text;
+----+-----+
| id | Test      |
+----+-----+
| 1  | Hello There |
| 2  | General Kenobi |
+----+-----+
2 rows in set (0.000 sec)

MariaDB [ISEA_Test]> delete from ISEA_Text where id=2;
Query OK, 1 row affected (0.010 sec)

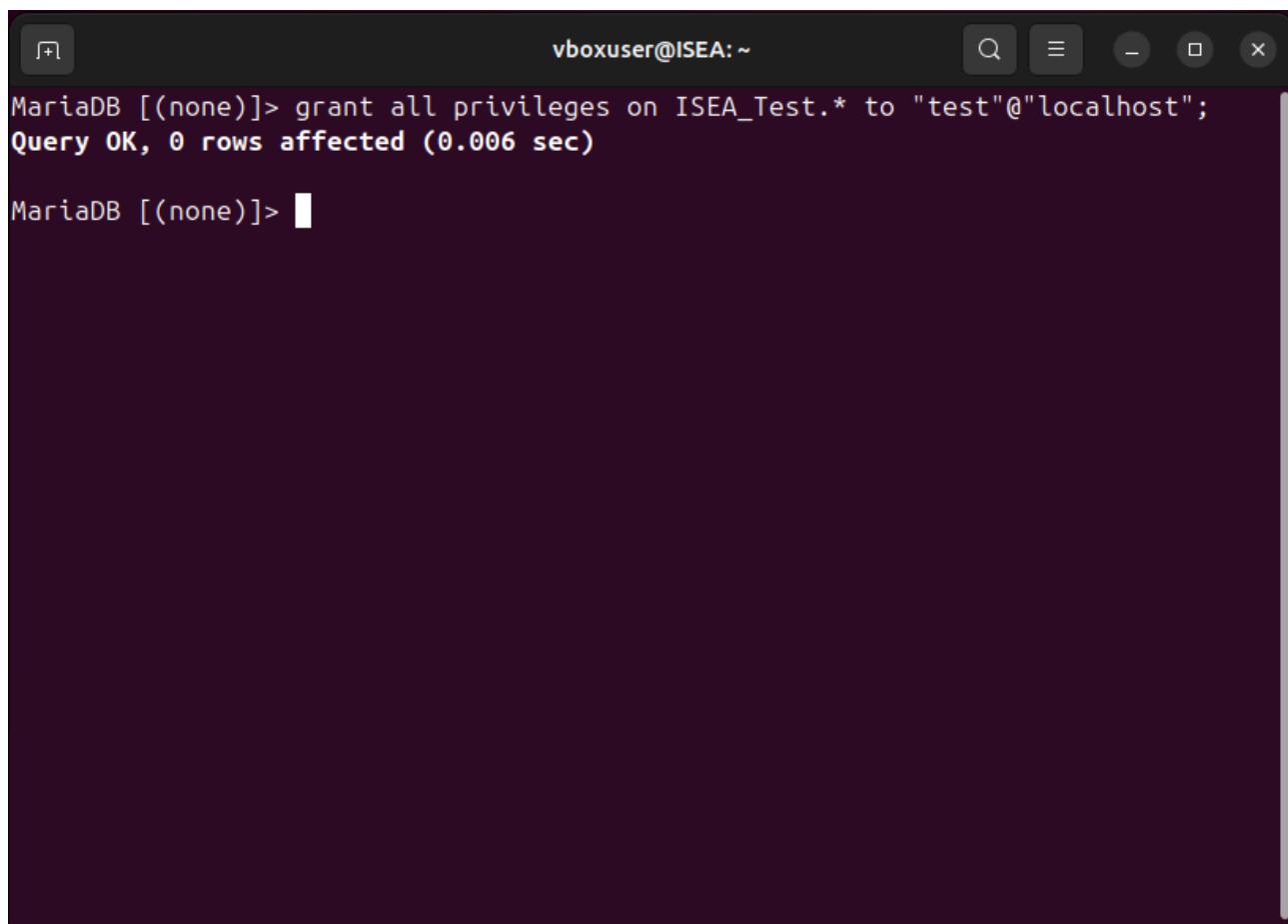
MariaDB [ISEA_Test]> select * from ISEA_Text;
+----+-----+
| id | Test      |
+----+-----+
| 2  | General Kenobi |
+----+-----+
1 row in set (0.000 sec)

MariaDB [ISEA_Test]>
```

*note that drop command removes the data entry with specified data. unique data to be used unless you want to delete multiple data points

Granting Permissions:

*its important to maintain data security and integrity

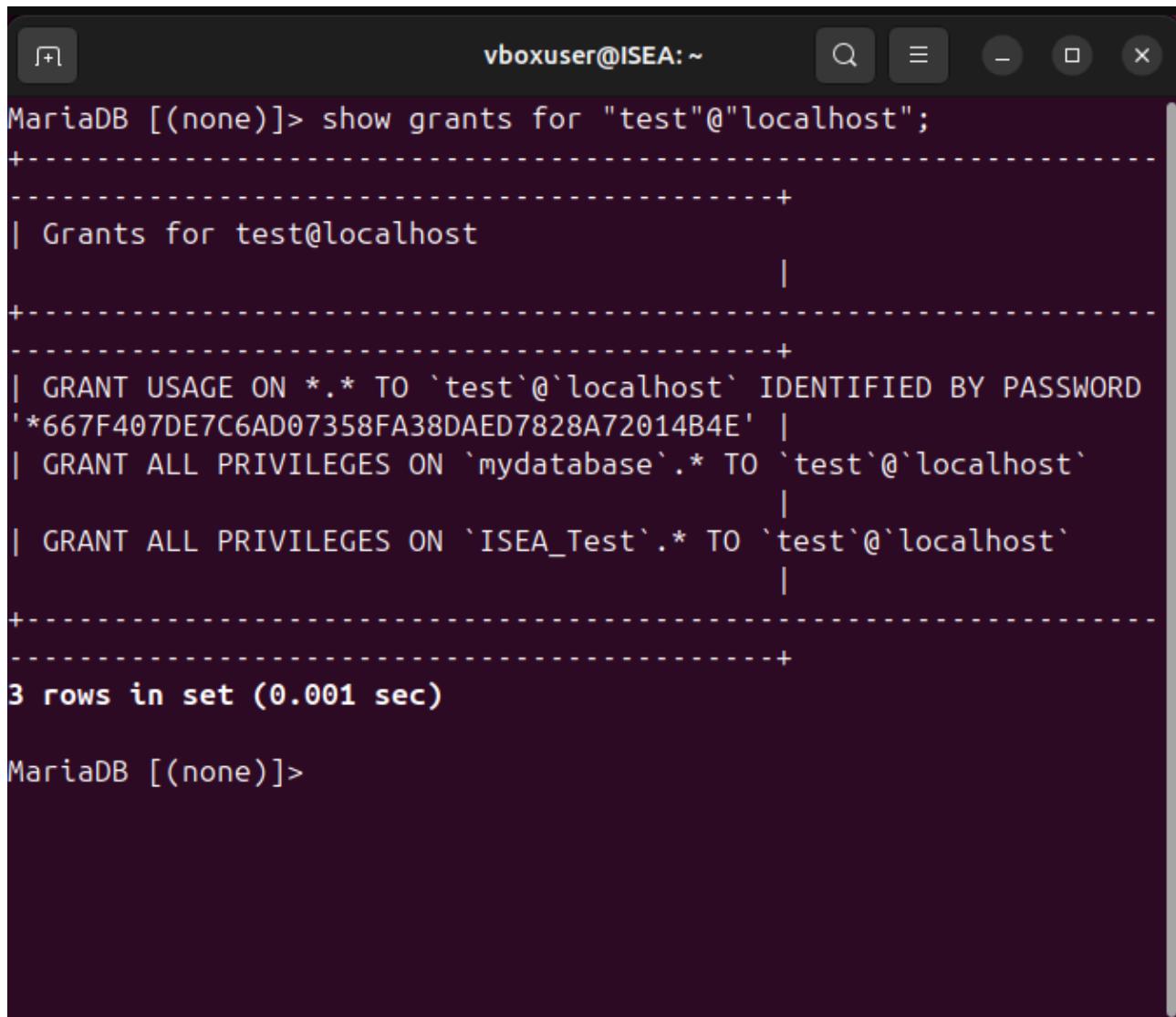


A screenshot of a terminal window titled "vboxuser@ISEA: ~". The window contains the following text:

```
MariaDB [(none)]> grant all privileges on ISEA_Test.* to "test"@"localhost";
Query OK, 0 rows affected (0.006 sec)

MariaDB [(none)]>
```

new perms (i have granted perms to mydatabase prior)



```
vboxuser@ISEA: ~
MariaDB [(none)]> show grants for "test"@"localhost";
+-----+
| Grants for test@localhost
| |
+-----+
| GRANT USAGE ON *.* TO `test`@`localhost` IDENTIFIED BY PASSWORD
'*667F407DE7C6AD07358FA38DAED7828A72014B4E' |
| GRANT ALL PRIVILEGES ON `mydatabase`.* TO `test`@`localhost` |
| GRANT ALL PRIVILEGES ON `ISEA_Test`.* TO `test`@`localhost` |
+-----+
3 rows in set (0.001 sec)

MariaDB [(none)]>
```

*note that mariadb doesnt warn if you are granting permission to a database that never existed

** . can be used in place of database name if you want to give access to all databases in server

Removing Permissions (removing mydatabase):

```
vboxuser@ISEA:~
```

```
MariaDB [(none)]> show grants for "test"@"localhost";
+-----+
| Grants for test@localhost
|   |
+-----+
-----+
| GRANT USAGE ON `.*` TO `test`@`localhost` IDENTIFIED BY PASSWORD '*667F407DE7C6AD07358FA38DAE
D7828A72014B4E' |
| GRANT ALL PRIVILEGES ON `mydatabase`.* TO `test`@`localhost` |
| GRANT ALL PRIVILEGES ON `ISEA_Test`.* TO `test`@`localhost` |
+-----+
-----+
3 rows in set (0.003 sec)

MariaDB [(none)]> revoke all privileges on mydatabase.* from "test"@"localhosy";
ERROR 1141 (42000): There is no such grant defined for user 'test' on host 'localhosy'
MariaDB [(none)]> revoke all privileges on mydatabase.* from "test"@"localhost";
Query OK, 0 rows affected (0.011 sec)

MariaDB [(none)]>
```

new perms

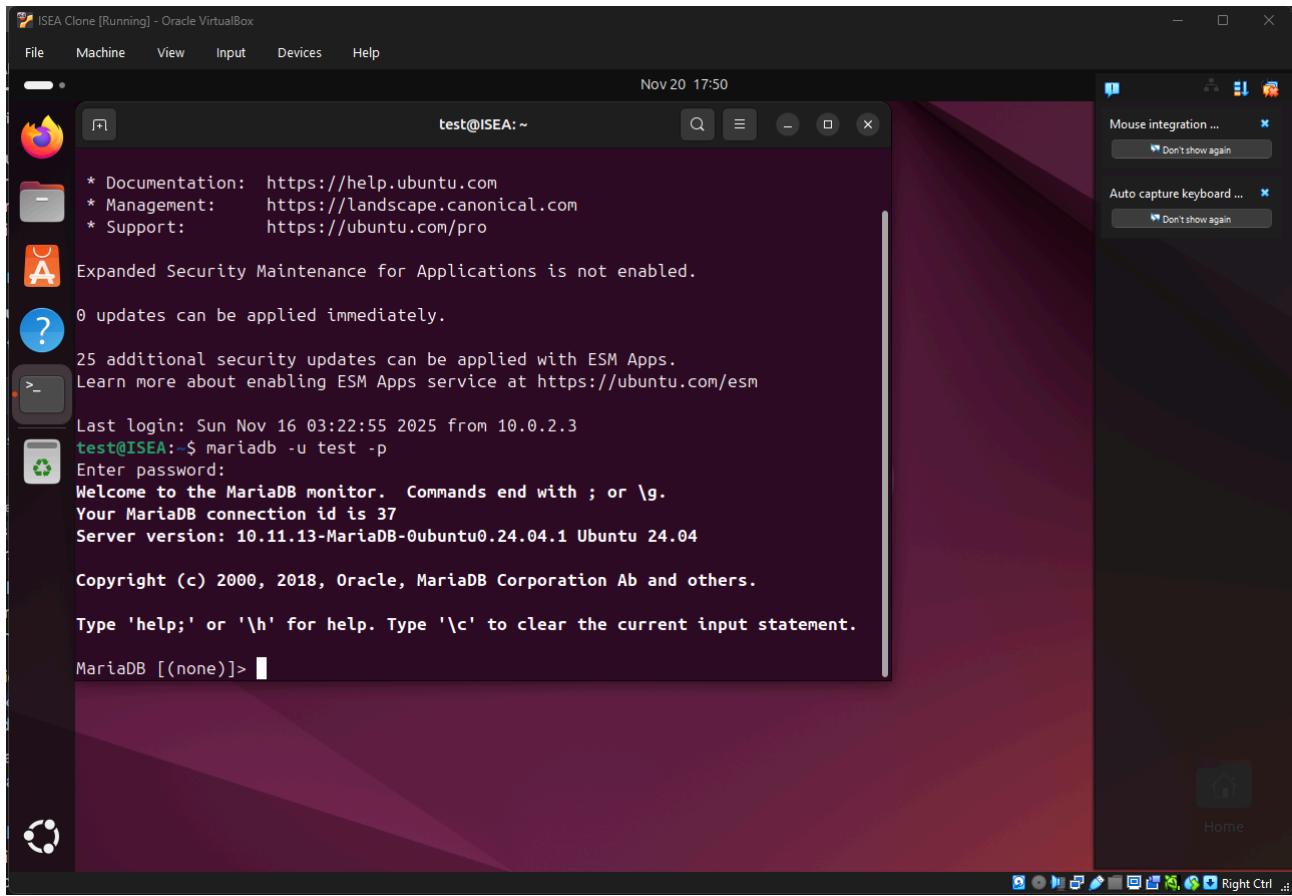
```
vboxuser@ISEA:~
```

```
MariaDB [(none)]> show grants for "test"@"localhost";
+-----+
| Grants for test@localhost
|   |
+-----+
-----+
| GRANT USAGE ON `.*` TO `test`@`localhost` IDENTIFIED BY PASSWORD '*667F407DE7C6AD07358FA38DAE
D7828A72014B4E' |
| GRANT ALL PRIVILEGES ON `ISEA_Test`.* TO `test`@`localhost` |
+-----+
-----+
2 rows in set (0.000 sec)

MariaDB [(none)]> █
```

Remote Access (Adding data to ISEA_Test, from clone VM):

SSH View



*note the VM's name in the top left

**MariaDB can login remotely without using SSH if configured for it according to my research

***Remote user needs to install MariaDB-client-core before being able to remotely login

after adding a few data entries

The screenshot shows a Linux desktop environment with a terminal window open. The terminal window title is "ISEA Clone [Running] - Oracle VirtualBox". The terminal session is as follows:

```
test@ISEA:~ Nov 20 18:10
| 2 | General Kenobi |
| 3 | It is I!!! |
+---+-----+
3 rows in set (0.000 sec)

MariaDB [ISEA_Test]> insert into ISEA_Text (id) values ("The Spanish Inquisition");
ERROR 1364 (HY000): Field 'Test' doesn't have a default value
MariaDB [ISEA_Test]> insert into ISEA_Text (Test) values ("The Spanish Inquisition");
Query OK, 1 row affected (0.005 sec)

MariaDB [ISEA_Test]> select * from ISEA_Text;
+----+-----+
| id | Test      |
+----+-----+
| 1  | I am not  |
| 2  | General Kenobi |
| 3  | It is I!!! |
| 4  | The Spanish Inquisition |
+----+-----+
4 rows in set (0.000 sec)

MariaDB [ISEA_Test]>
```

*this is the view of the table in the database

local view

```
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.  
MariaDB [(none)]> use ISEA_Test  
Reading table information for completion of table and column names  
You can turn off this feature to get a quicker startup with -A  
Database changed  
MariaDB [ISEA_Test]> show ISEA_Text;  
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to  
your MariaDB server version for the right syntax to use near 'ISEA_Text' at line 1  
MariaDB [ISEA_Test]> select * from ISEA_Text  
-> ;  
+----+-----+  
| id | Test |  
+----+-----+  
| 1 | I am not |  
| 2 | General Kenobi |  
| 3 | It is I!!! |  
| 4 | The Spanish Inquisition |  
+----+-----+  
4 rows in set (0.001 sec)  
  
MariaDB [ISEA_Test]>
```

*again, note the VM's name in the top left

End of Document