Installation method chosen:

```
Oracle VirtualBox
```

Ubuntu Installation in VirtualBox

Objective

To install and configure Ubuntu within a virtualized environment using Oracle VirtualBox, enabling safe experimentation and development without altering the host operating system.

Tools Used

- **Host OS**: Windows 11
- **Virtualization Software**: Oracle VirtualBox
- **Guest OS**: Ubuntu (Latest LTS ISO image)

Installation Steps

1. Virtual Machine Setup

- Created a new VM in VirtualBox and selected **Linux → Ubuntu (64-bit)** as the OS type.

- Allocated **4 GB RAM** and **20 GB virtual hard disk** (VDI, dynamically allocated) for optimal performance.

2. ISO Boot Configuration

- Mounted the official Ubuntu ISO file as the virtual optical disk.
- Booted the VM and initiated the Ubuntu installation process.

3. Ubuntu Installation

- Selected **Normal Installation** to include essential software and GUI tools.
- Configured keyboard layout, timezone, and user credentials.
- Chose **Erase disk and install Ubuntu** (within VM only) to format the virtual drive safely.

4. Post-Installation Enhancements

- Installed **VirtualBox Guest Additions** to enable:
  - Clipboard sharing between host and guest
  - Drag-and-drop functionality
  - Full-screen resolution support

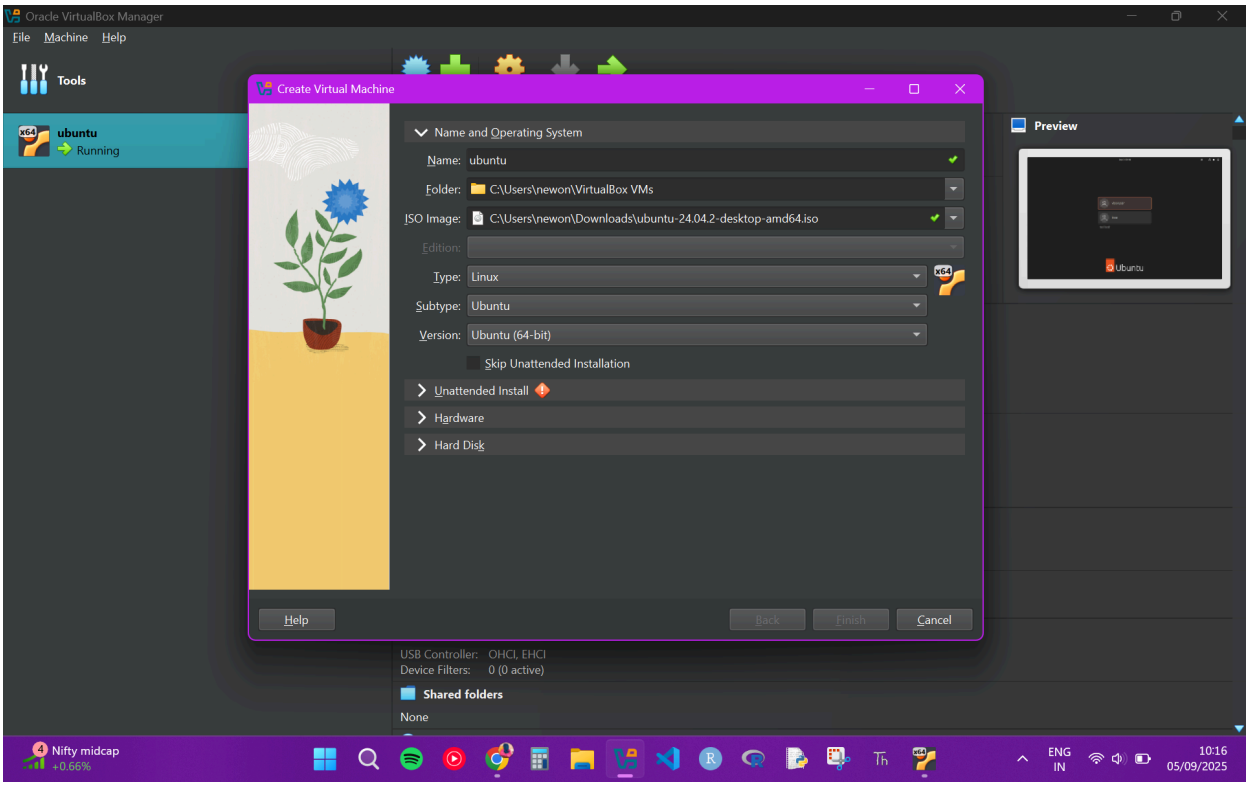
Outcome

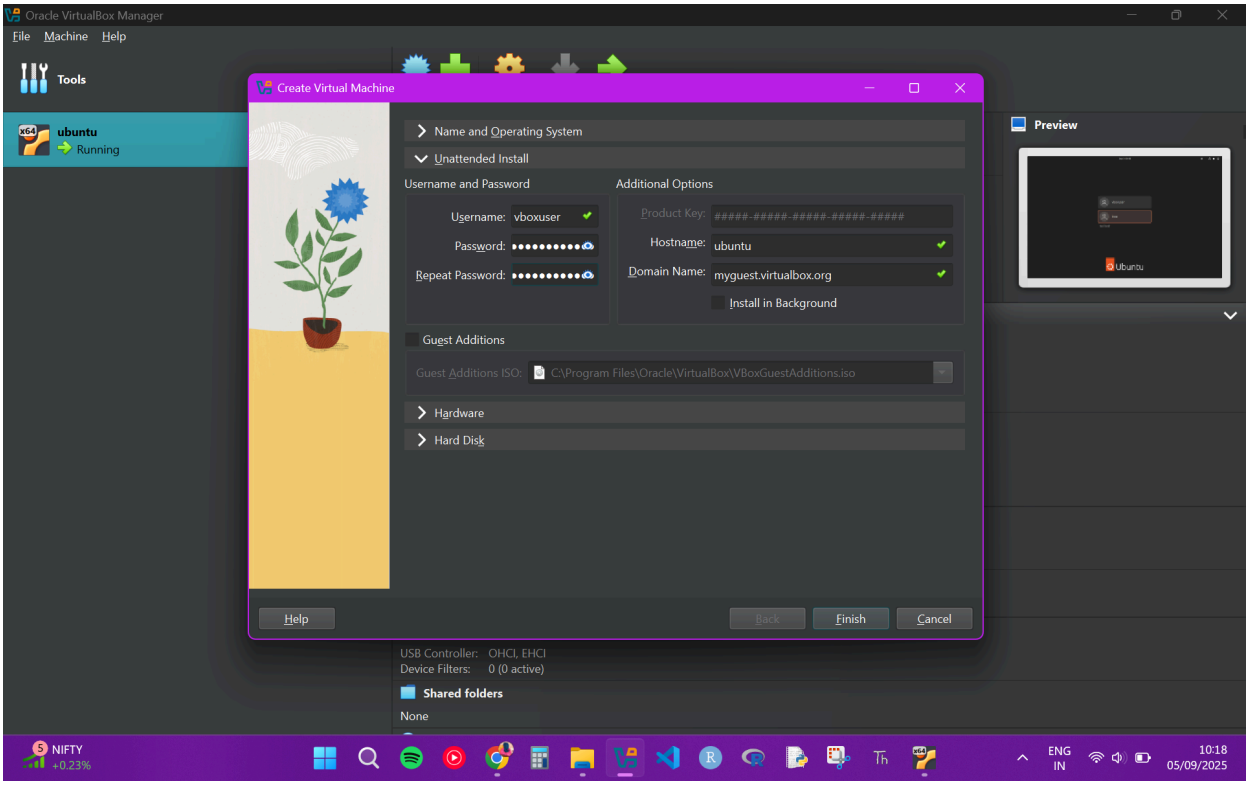
Successfully deployed a fully functional Ubuntu environment within VirtualBox. The setup supports software testing, coding, and academic experimentation in a controlled, reversible environment.

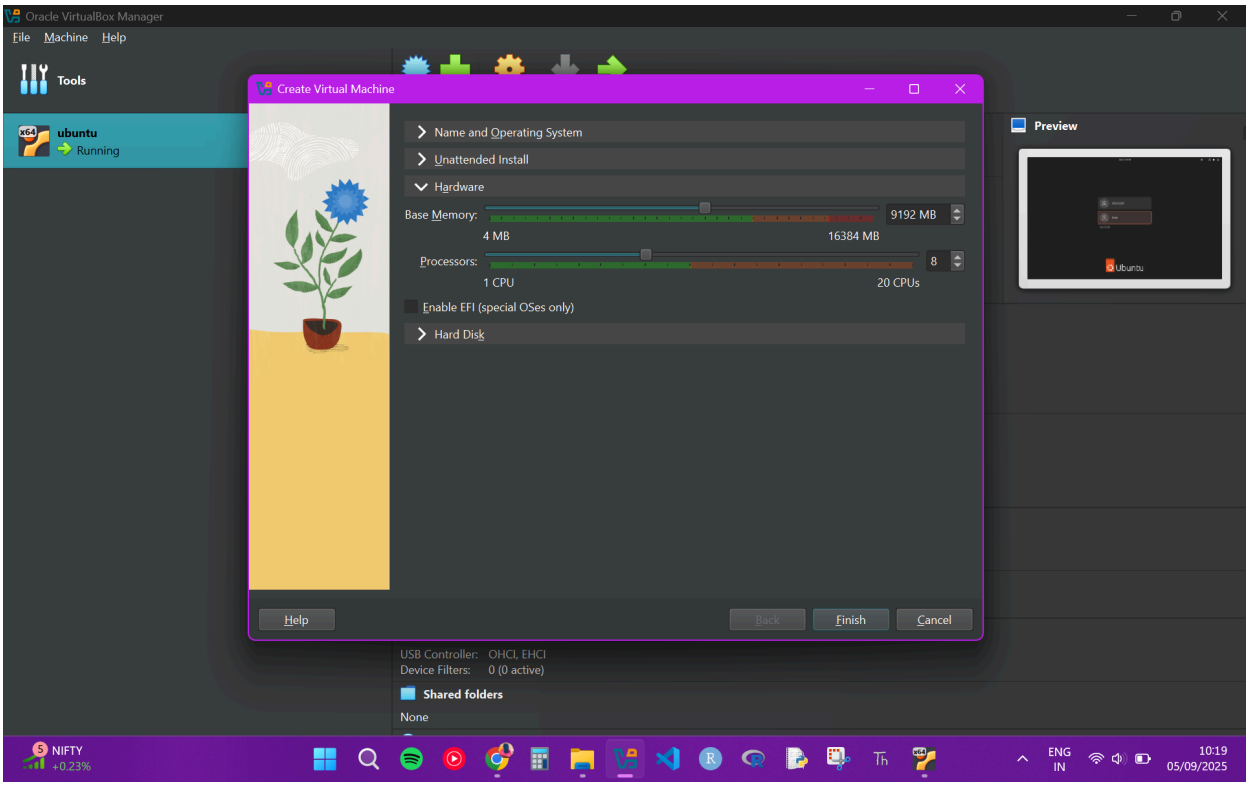
Reflection

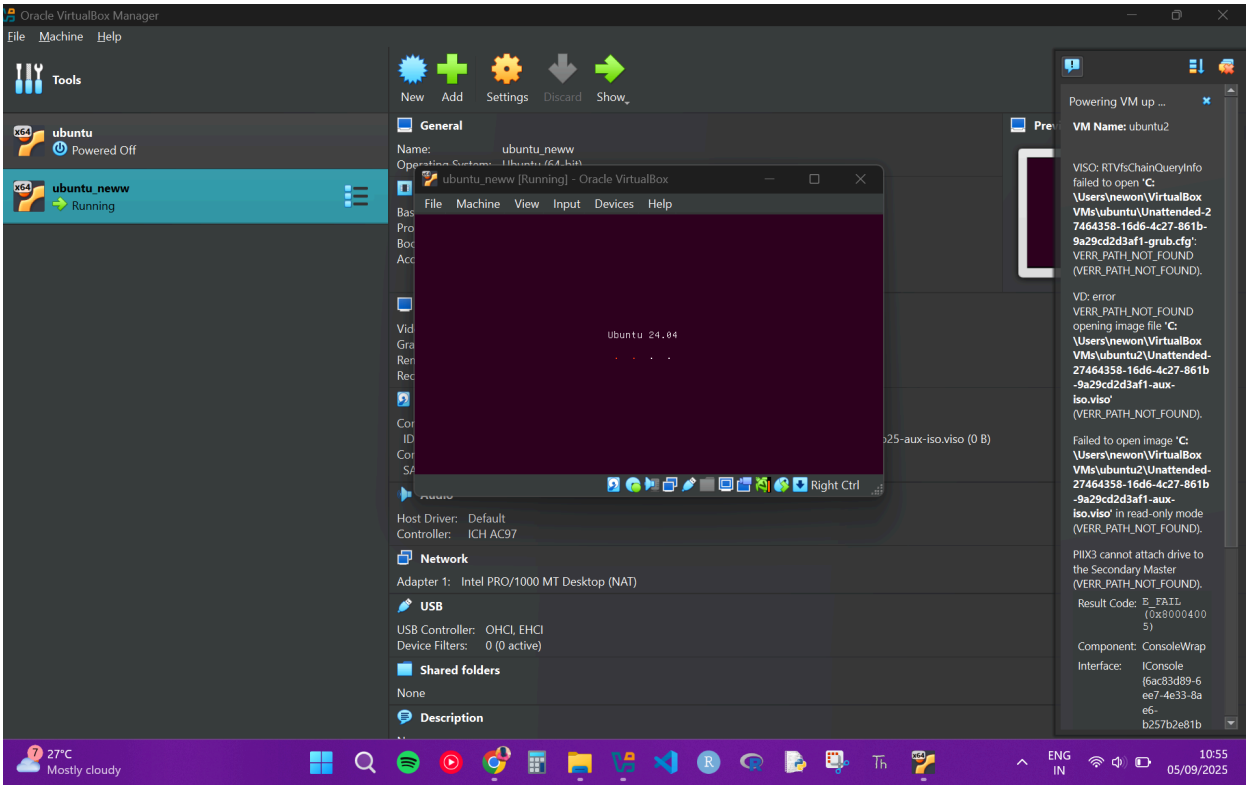
This installation demonstrates the power of virtualization in academic and development workflows. It allows for modular experimentation, risk-free system configuration, and efficient resource utilization.

Installation screenshots:

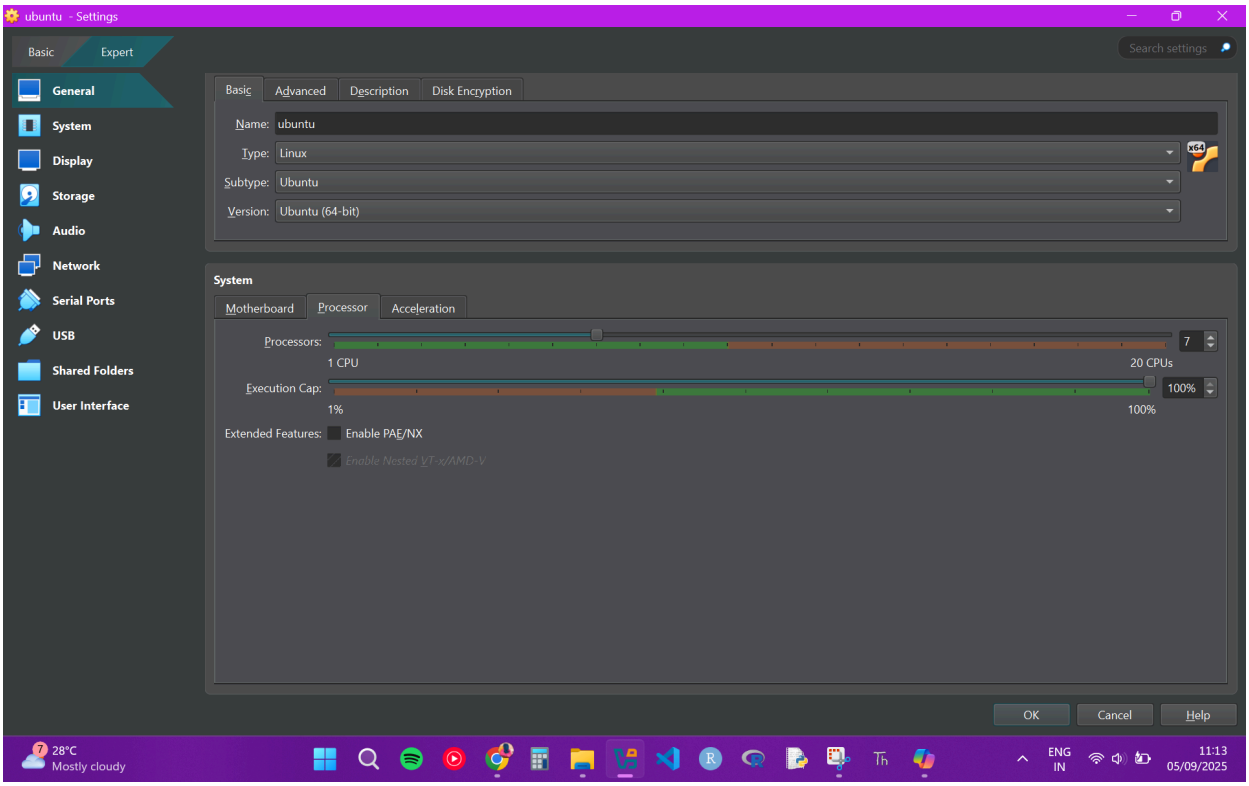

Oracle VirtualBox Manager
File Machine Help
Tools
ubuntu
Running
Create Virtual Machine
Name and Operating System
Name: ubuntu
Folder: C:\Users\newon\VirtualBox VMs
ISO Image: C:\Users\newon\Downloads\ubuntu-24.04.2-desktop-amd64.iso
Edition:
Type: Linux
Subtype: Ubuntu
Version: Ubuntu (64-bit)
Skip Unattended Installation
Unattended Install
Hardware
Hard Disk
Help
Back
Finish
Cancel
Preview
USB Controller: OHCI, EHCI
Device Filters: 0 (0 active)
Shared folders
None
Nifty midcap
+0.66%
ENG
IN
10:16
05/09/2025

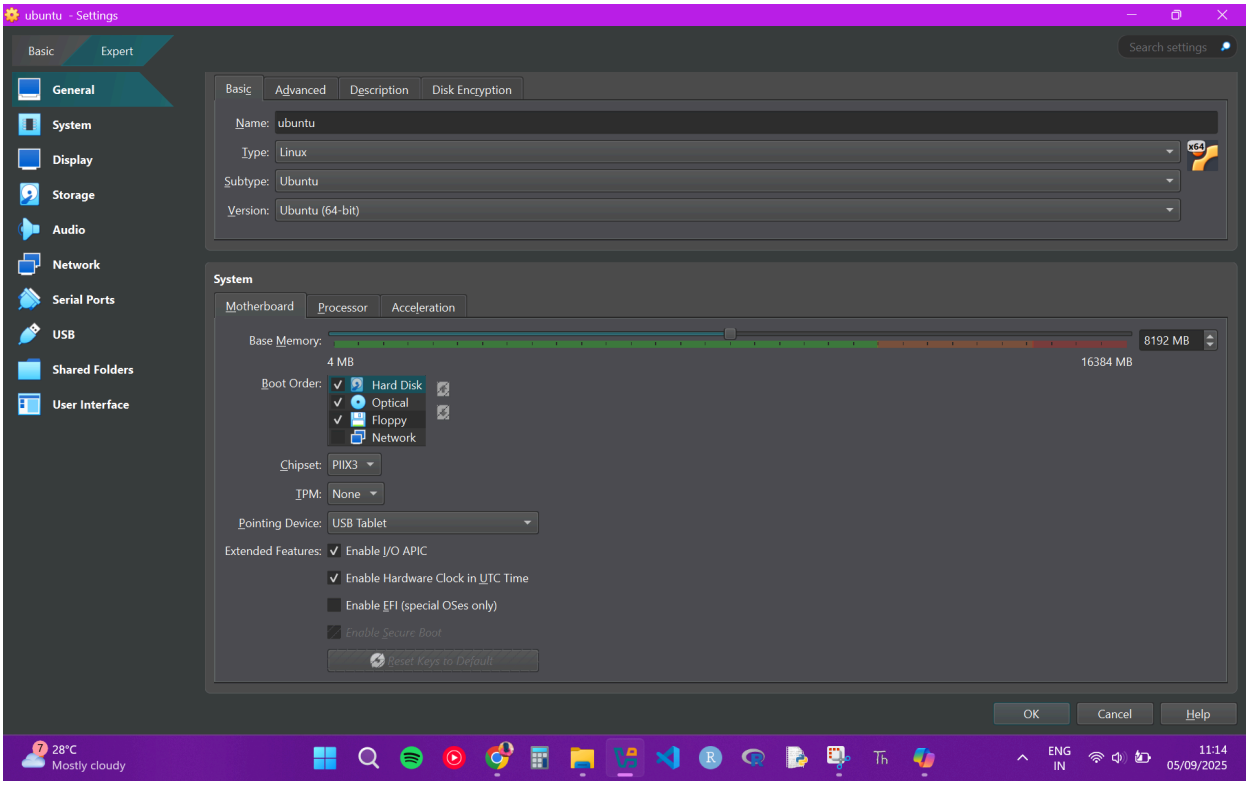

Oracle VirtualBox Manager
File Machine Help
Tools
ubuntu
Running
Create Virtual Machine
Name and Operating System
Unattended Install
Username and Password
Username: vboxuser
Password:
Repeat Password:
Additional Options
Product Key: #####-#####-#####-#####-#####
Hostname: ubuntu
Domain Name: myguest.virtualbox.org
Install in Background
Guest Additions
Guest Additions ISO: C:\Program Files\Oracle\VirtualBox\VBoxGuestAdditions.iso
Hardware
Hard Disk
Help
Back
Finish
Cancel
Preview
USB Controller: OHCI, EHCI
Device Filters: 0 (0 active)
Shared folders
None
NIFTY
+0.23%
ENG
IN
10:18
05/09/2025

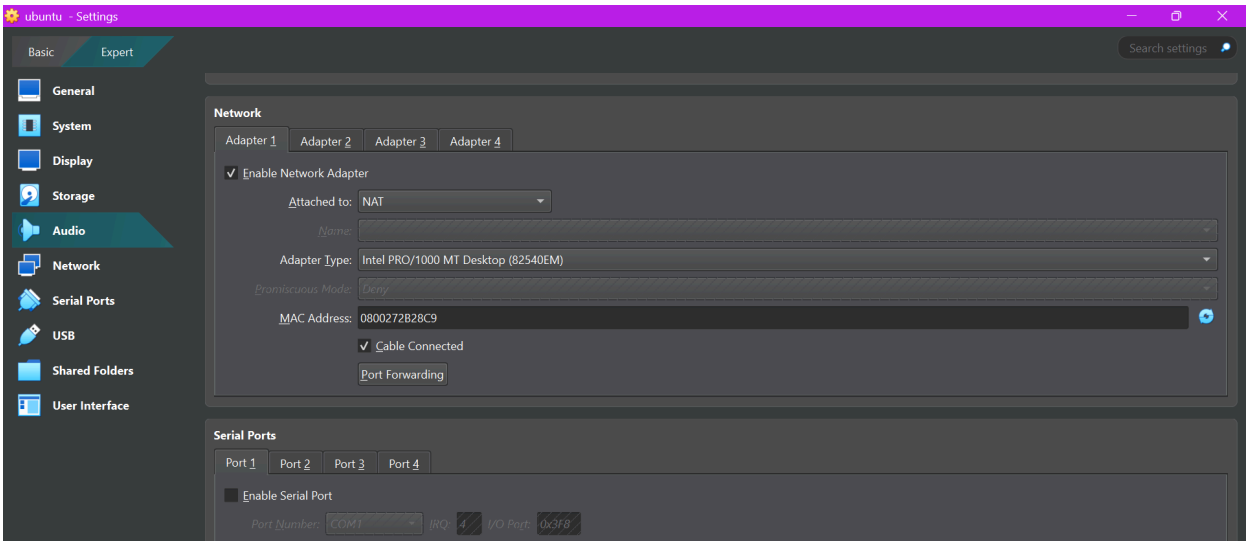




Setup screenshots:

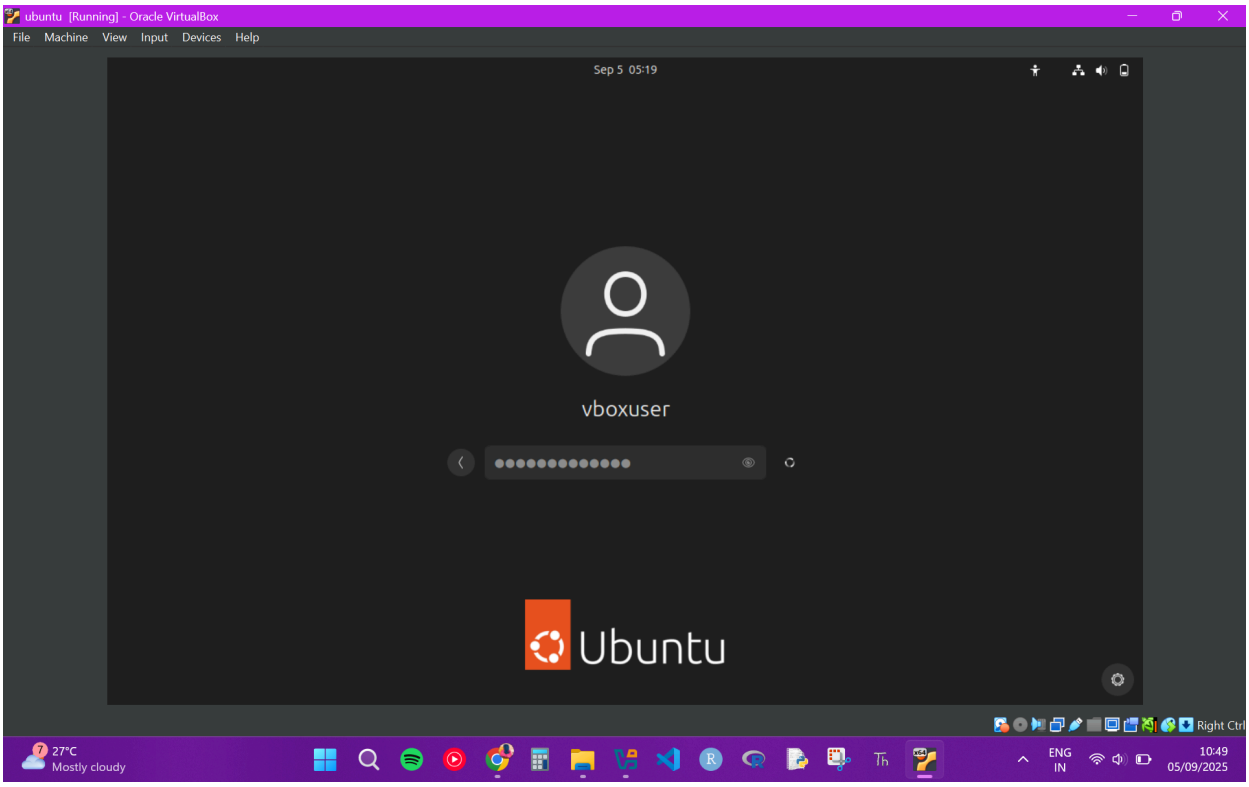

ubuntu - Settings
Basic
Expert
Search settings
General
System
Display
Storage
Audio
Network
Serial Ports
USB
Shared Folders
User Interface
Basic
Advanced
Description
Disk Encryption
Name: ubuntu
Type: Linux
Subtype: Ubuntu
Version: Ubuntu (64-bit)
System
Motherboard
Processor
Acceleration
Processors: 7
1 CPU
20 CPUs
Execution Cap: 100%
1%
100%
Extended Features: Enable PAE/NX
Enable Nested VT-x/AMD-V
OK
Cancel
Help
28°C
Mostly cloudy
ENG
IN
11:13
05/09/2025

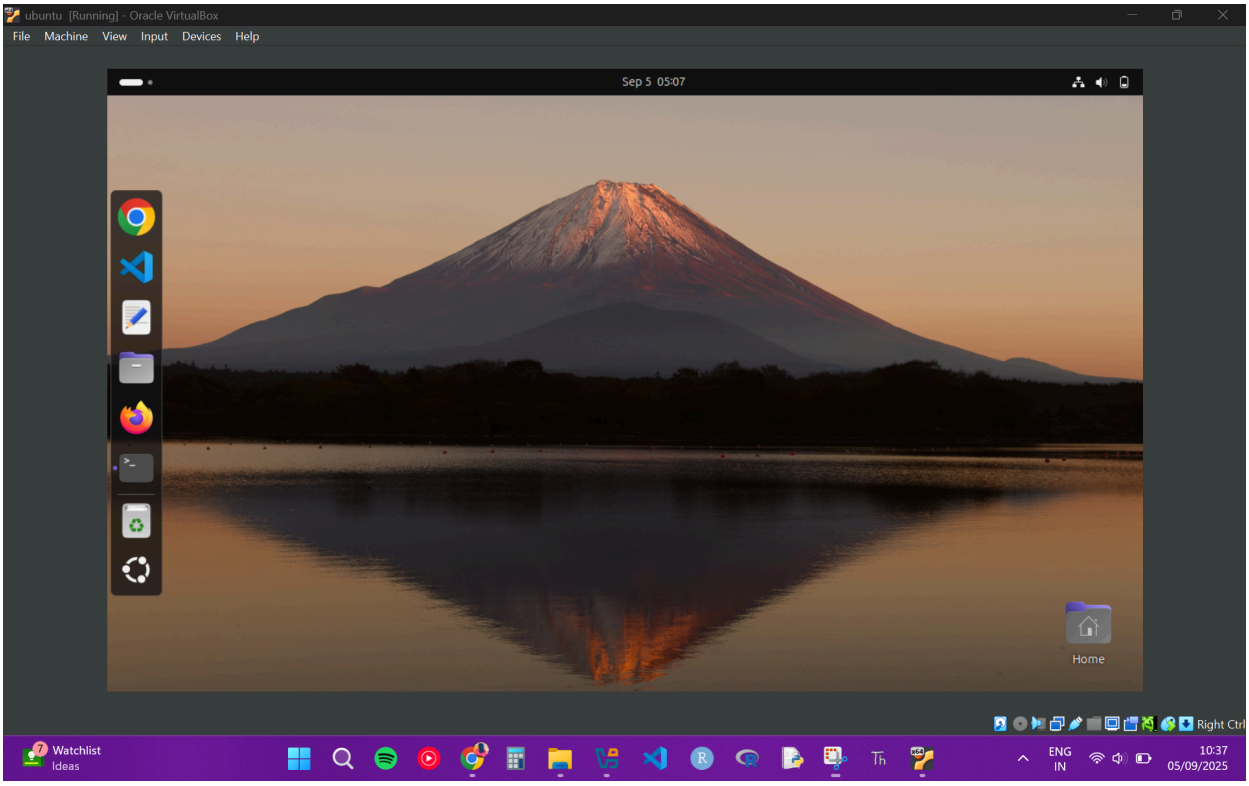

ubuntu - Settings
Basic
Expert
Search settings
General
System
Display
Storage
Audio
Network
Serial Ports
USB
Shared Folders
User Interface
Basic
Advanced
Description
Disk Encryption
Name: ubuntu
Type: Linux
Subtype: Ubuntu
Version: Ubuntu (64-bit)
System
Motherboard
Processor
Acceleration
Base Memory: 8192 MB
4 MB
16384 MB
Boot Order:
Hard Disk
Optical
Floppy
Network
Chipset: PIIX3
TPM: None
Pointing Device: USB Tablet
Extended Features: Enable I/O APIC
Enable Hardware Clock in UTC Time
Enable EFI (special OSes only)
Enable Secure Boot
Reset Keys to Default
OK
Cancel
Help
28°C
Mostly cloudy
ENG
IN
11:14
05/09/2025


ubuntu - Settings
Basic
Expert
Search settings
General
System
Display
Storage
Audio
Network
Serial Ports
USB
Shared Folders
User Interface
Network
Adapter 1
Adapter 2
Adapter 3
Adapter 4
Enable Network Adapter
Attached to:
NAT
Name:
Adapter Type:
Intel PRO/1000 MT Desktop (82540EM)
Promiscuous Mode:
Deny
MAC Address:
0800272B28C9
Cable Connected
Port Forwarding
Serial Ports
Port 1
Port 2
Port 3
Port 4
Enable Serial Port
Port Number:
COM1
IRQ:
4
I/O Port:
0x3F8


28°C
Mostly cloudy
ENG
IN
11:15
05/09/2025

First Login:





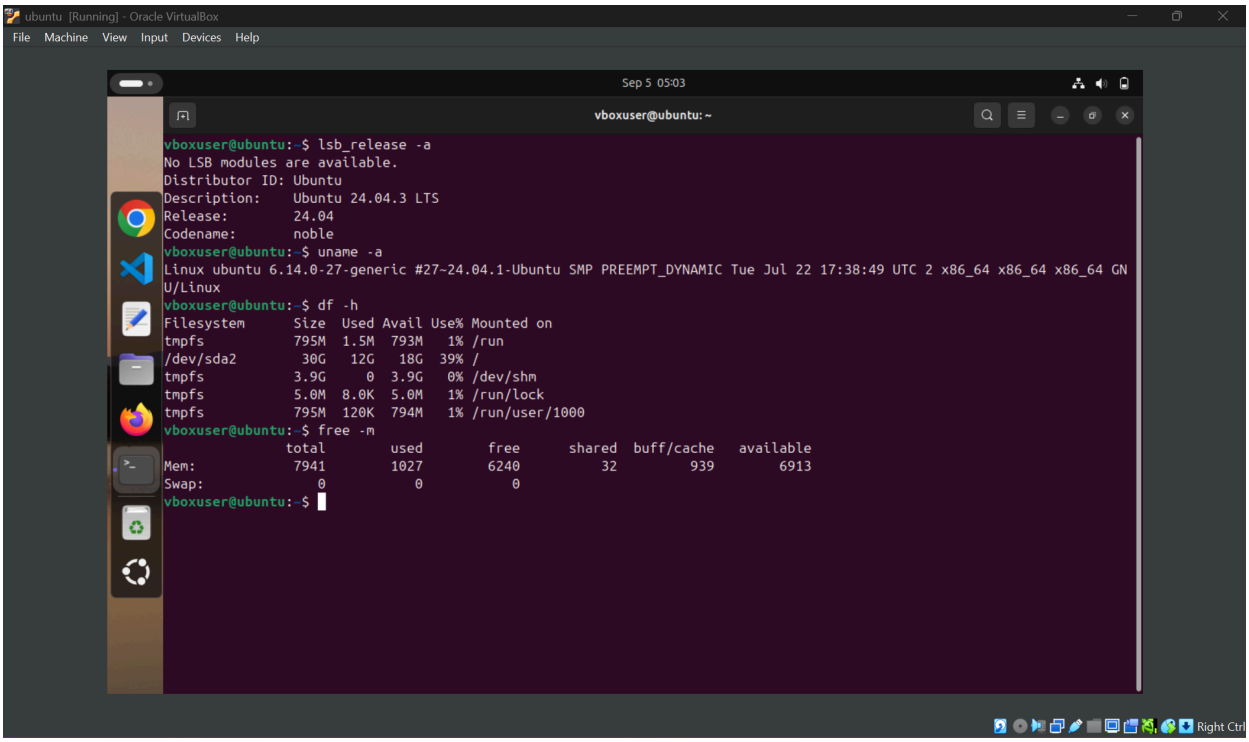
Terminal outputs of the given commands.

```
lsb_release -a (shows Ubuntu version).

uname -a (kernel info).

df -h (disk usage).
```

`free -m` (memory usage).



Challenges I faced during installation:

1. The ubuntu download took a lot of time since I downloaded it from web.
2. Setting up configurations were pretty detail-oriented.

Extra Questions:

What are two advantages of installing Ubuntu in VirtualBox?

```
1. Its is handy and i can switch between windows and linux any time.
2. It is fast and versatile.
```

What are two advantages of dual booting instead of using a VM?

```
1. More superior performance.
2. Full hardware access.
```