

LAB-0 – Linux Installation and Setup

This experiment covers installing **VirtualBox**, setting up **Ubuntu** inside it, installing **Visual Studio Code** on Ubuntu, running few usual commands.

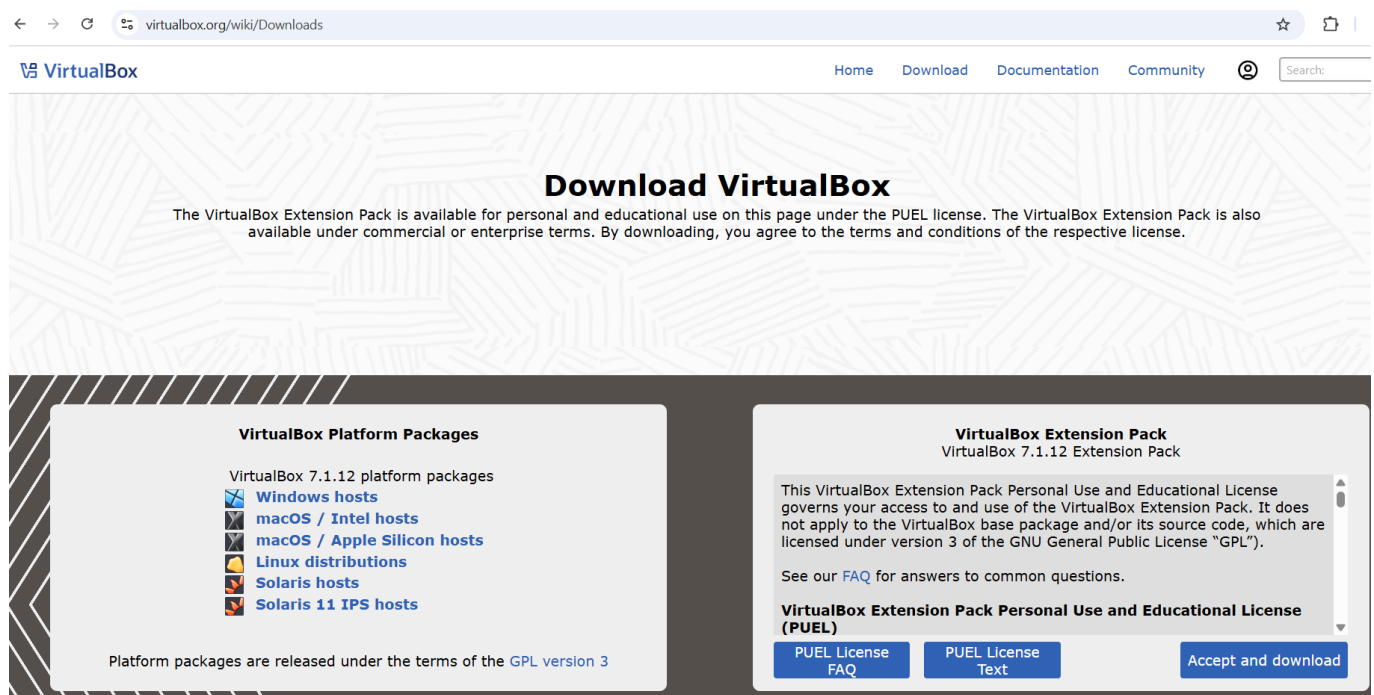
1. Installation Method

Chosen Method: **Option A – Virtual Machine**

2. Installation Steps

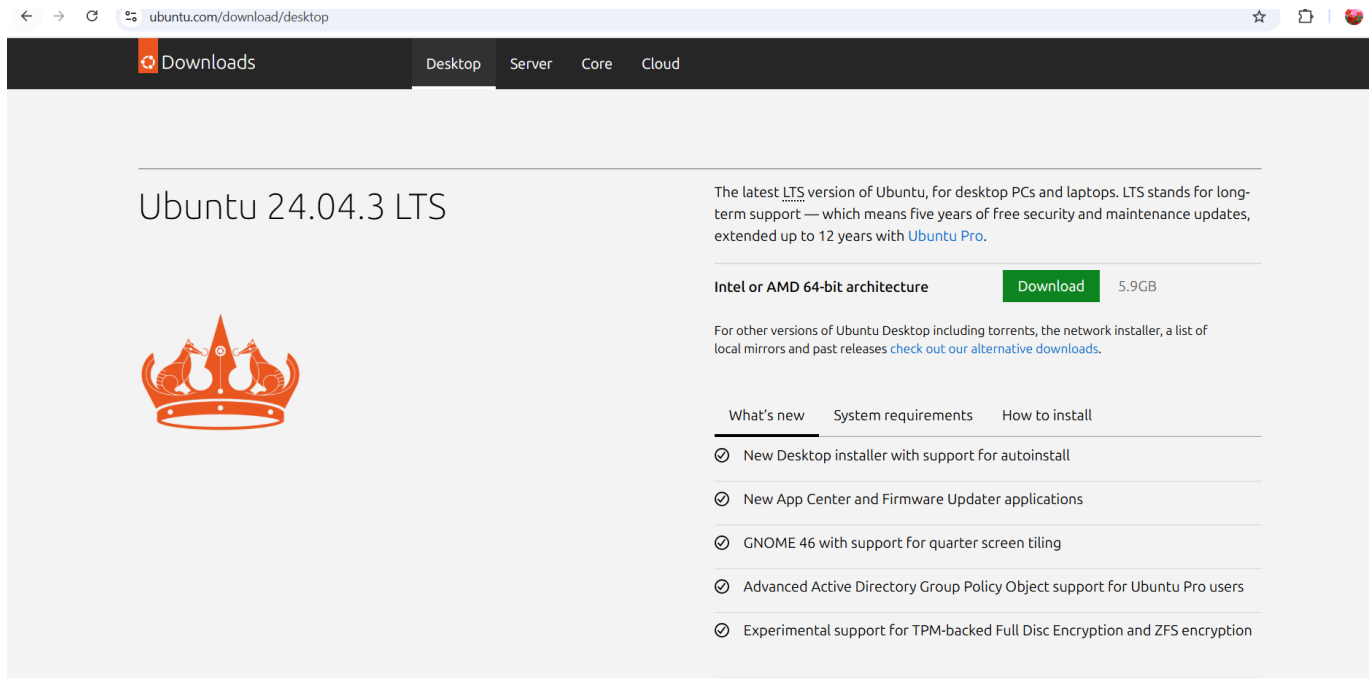
1 Install VirtualBox

1. Download VirtualBox from the official site:
<https://www.virtualbox.org/wiki/Downloads>
2. Choose **Windows hosts**.
3. Run the installer and follow default settings.



2 Download Ubuntu ISO

1. Visit: <https://ubuntu.com/download/desktop>
2. Select **Ubuntu 22.04 LTS** and download the **.iso** file.



Ubuntu 24.04.3 LTS

The latest LTS version of Ubuntu, for desktop PCs and laptops. LTS stands for long-term support — which means five years of free security and maintenance updates, extended up to 12 years with [Ubuntu Pro](#).

Intel or AMD 64-bit architecture [Download](#) 5.9GB

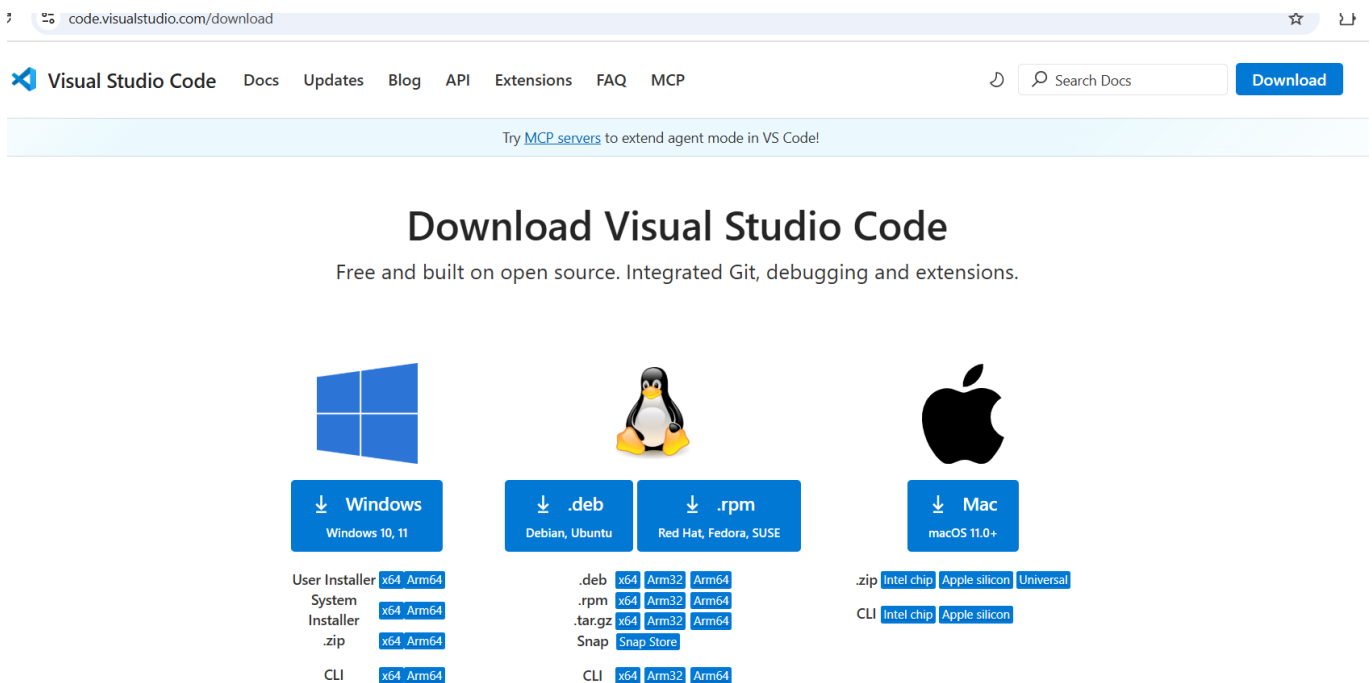
For other versions of Ubuntu Desktop including torrents, the network installer, a list of local mirrors and past releases [check out our alternative downloads](#).

What's new System requirements How to install

- ✓ New Desktop installer with support for autoinstall
- ✓ New App Center and Firmware Updater applications
- ✓ GNOME 46 with support for quarter screen tiling
- ✓ Advanced Active Directory Group Policy Object support for Ubuntu Pro users
- ✓ Experimental support for TPM-backed Full Disc Encryption and ZFS encryption

3 Install VS Code in Ubuntu

1. In Ubuntu, open **Firefox** (default browser).
2. Go to: <https://code.visualstudio.com/Download>
3. Download the **.deb** package for Debian/Ubuntu.
4. Double-click the **.deb** file → Install via Ubuntu Software.
5. Launch **VS Code** from the Applications menu.



code.visualstudio.com/download

Visual Studio Code Docs Updates Blog API Extensions FAQ MCP

Try [MCP servers](#) to extend agent mode in VS Code!

Download Visual Studio Code

Free and built on open source. Integrated Git, debugging and extensions.

Windows 10, 11

Debian, Ubuntu

Red Hat, Fedora, SUSE

Mac macOS 11.0+

User Installer x64 Arm64

System Installer x64 Arm64

.zip x64 Arm64

CLI x64 Arm64

.deb x64 Arm32 Arm64

.rpm x64 Arm32 Arm64

.tar.gz x64 Arm32 Arm64

Snap Snap Store

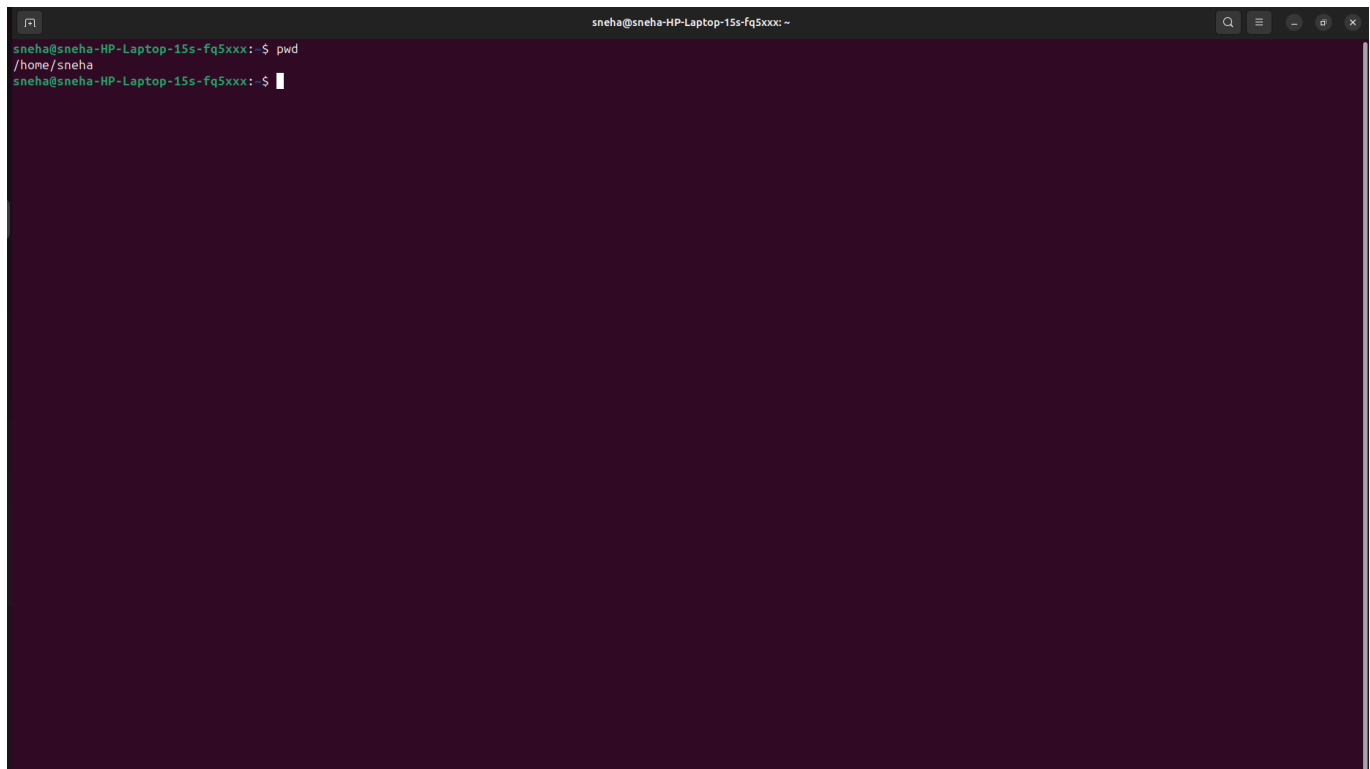
CLI x64 Arm32 Arm64

.zip Intel chip Apple silicon Universal

CLI Intel chip Apple silicon

5 Final Setup

- You can now use VS Code inside Ubuntu for coding.
- Enable **full-screen mode** in VirtualBox for a better experience.

A terminal window with a dark purple background. The title bar reads 'sneha@sneha-HP-Laptop-15s-fq5xxx: ~'. The terminal shows the following commands and output:

```
sneha@sneha-HP-Laptop-15s-fq5xxx:~$ pwd
/home/sneha
sneha@sneha-HP-Laptop-15s-fq5xxx:~$
```

✓ You have successfully set up VirtualBox, Ubuntu, and VS Code!

3. Terminal Outputs

❶ lsb_release -a

The command `lsb_release -a` displays information about the Linux distribution you are running.

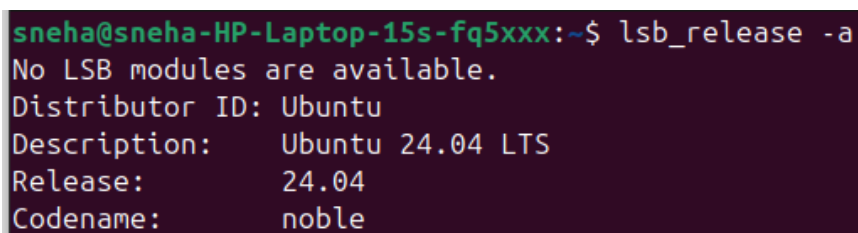
`lsb_release` = Linux Standard Base release.

`-a` option = shows all available details.

It typically outputs:

- Distributor ID (e.g., Ubuntu, Debian)
- Description (full name of the OS + version)
- Release (version number, e.g., 22.04)
- Codename (e.g., jammy, focal)

Sample Output:

A terminal window with a dark purple background. The title bar reads 'sneha@sneha-HP-Laptop-15s-fq5xxx: ~'. The terminal shows the command `lsb_release -a` and its output:

```
sneha@sneha-HP-Laptop-15s-fq5xxx:~$ lsb_release -a
No LSB modules are available.
Distributor ID: Ubuntu
Description:    Ubuntu 24.04 LTS
Release:        24.04
Codename:       noble
```

2 \$ uname -a

The command `uname -a` prints detailed system information about the Linux kernel and machine.

`uname` = Unix Name

`-a` option = shows all available details.

It typically outputs:

- Kernel name (e.g., Linux)
- Hostname of the machine
- Kernel release (version number)
- Kernel version (build details)
- Machine hardware name (e.g., x86_64)
- Processor type
- Hardware platform
- Operating system

Sample Output:

```
sneha@sneha-HP-Laptop-15s-fq5xxx:~$ uname -a
Linux sneha-HP-Laptop-15s-fq5xxx 6.8.0-31-generic #31-Ubuntu SMP PREEMPT_DYNAMIC
Sat Apr 20 00:40:06 UTC 2024 x86_64 x86_64 x86_64 GNU/Linux
```

3 df -h

The command `df -h` displays the disk space usage of all mounted file systems.

`df` = disk free

`-h` option = human-readable format (sizes shown in KB, MB, GB instead of raw blocks).

It typically shows:

- Filesystem name (e.g., `/dev/sda1`)
- Size of the partition
- Used space
- Available space
- Percentage of usage
- Mount point (where the filesystem is attached, e.g., `/` or `/home`)

Sample Output:

!

```
sneha@sneha-HP-Laptop-15s-fq5xxx:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
tmpfs           762M  2.5M  759M   1% /run
/dev/nvme0n1p8  39G   13G   24G  36% /
tmpfs           3.8G   45M  3.7G   2% /dev/shm
tmpfs           5.0M   8.0K  5.0M   1% /run/lock
efivarfs        256K  163K   89K  65% /sys/firmware/efi/efivars
/dev/nvme0n1p1  256M   77M  180M  30% /boot/efi
tmpfs           762M  2.5M  759M   1% /run/user/1000
```

4 free -m

The command `free -m` displays the system's memory (RAM and swap) usage in megabytes.

`free` = shows memory usage summary.

`-m` option = presents values in MB (megabytes).

It typically shows:

- **total**: total installed RAM
- **used**: RAM currently in use
- **free**: unused RAM
- **shared**: memory used by tmpfs/shmem
- **buff/cache**: memory used for disk caching
- **available**: RAM available for starting new applications
- **swap**: usage of swap space (virtual memory)

Sample Output:

```
sneha@sneha-HP-Laptop-15s-fq5xxx:~$ free -m
              total        used        free      shared  buff/cache   available
Mem:           7612         5324          702         1119         2630         2287
Swap:          4095           4         4091
```

4. Reflection

During installation, the main challenges I faced were:

- Setting up VirtualBox guest additions.
- Configuring correct RAM and disk size.
- Enabling virtualization in BIOS.

5. Extra Questions

Q1. What are two advantages of installing Ubuntu in VirtualBox?

- Can run Ubuntu without affecting existing OS.
- Easy to take snapshots and revert to earlier states.

Q2. What are two advantages of dual booting instead of using a VM?

- Better performance (uses hardware directly).
- Access to full system resources (RAM, GPU, disk).