# S. Y. B. Tech (ECE)

**Trimester: VI Subject: Linux Based Python Laboratory (CET2005A)**

# Name: Class:

**Roll No.: Batch:**

# Experiment – 01 Title: Installation of Linux Operating System Performed on:

**Marks**

**Teacher’s Signature with date**

**Submitted on:**

**Aim**: To install Linux Operating System

# Objective:

1. To learn the steps to install Linux operating system (virtual box)
2. To learn the features of Linux operating system

# Theory:

What is Linux?

Linux is an open-source Operating System (OS).

An operating system is a software that manages all of the hardware resources associated with your desktop or laptop. The operating system manages the communication between the software and the hardware. The software wouldn’t work without the operating system (OS).

The Linux operating system comprises several different components:

1. **Bootloader –** The software that manages the boot process of your computer.
2. **Kernel –** The kernel is the core of the system and manages the CPU, memory, and peripheral devices. The kernel is the lowest level of the OS.
3. **Init system –** This is a sub-system that bootstraps the user space and is charged with controlling daemons. One of the most widely used init systems is systemd? which also happens to be one of the most controversial. It is the init system that manages the boot process, once the initial booting is handed over from the bootloader (i.e., GRUB or GRand Unified Bootloader).
4. **Daemons –** These are background services (printing, sound, scheduling, etc.) that either start up during boot or after you log into the desktop.
5. **Graphical server –** This is the sub-system that displays the graphics on your monitor. It is commonly referred to as the X server or just X.
6. **Desktop environment –** This is the piece that the users actually interact with. There are many desktop environments to choose from (GNOME, Cinnamon, Mate, Pantheon, Enlightenment, KDE, Xfce, etc.). Each desktop environment includes built-in applications (such as file managers, configuration tools, web browsers, and games).
7. **Applications –** Desktop environments do not offer the full array of apps. Just like Windows and macOS, Linux offers thousands upon thousands of high-quality software titles that can be easily found and installed. Most modern Linux distributions include App Store-like tools that centralize and simplify application installation. For example, Ubuntu Linux has the Ubuntu Software Center which allows you to quickly search among the thousands of apps and install them from one centralized location.

# Why use Linux?

Linux combine the reliability with zero cost of entry and one has the perfect solution for a desktop platform. Linux can be installed on any number of computers without paying a cent for software or server licensing.

Linux is generally far less vulnerable to attacks like ransomware, malware, or viruses. Server reboots are only necessary if the kernel is updated. Linux server run for years without being rebooted. If you follow the regular recommended updates, stability and dependability are practically assured.

# Open source

Linux is also distributed under an open-source license. Open source follows these key tenants:

* The freedom to run the program, for any purpose.
* The freedom to study how the program works, and change it to make it do what you wish.
* The freedom to redistribute copies so you can help your neighbor.
* The freedom to distribute copies of your modified versions to others.

# What is a “distribution?”

Linux has a number of different versions to suit any type of user. From new users to hard-core users, you’ll find a “flavor” of Linux to match your needs. These versions are called distributions (or, in the short form, “distros”). Nearly every distribution of Linux can be downloaded for free, burned onto disk (or USB thumb drive), and installed (on as many machines as you like).

Popular Linux distributions include:

* + LINUX MINT
  + MANJARO
  + DEBIAN
  + UBUNTU
  + ANTERGOS
  + SOLUS
  + FEDORA
  + ELEMENTARY OS
  + OPENSUSE

And the server distributions are:

* 1. Red Hat Enterprise Linux
  2. Ubuntu Server
  3. Centos
  4. SUSE Enterprise Linux

# Features of Linux Operating System:

1. **Portable Environment**

Linux software operates flawlessly on a variety of hardware platforms. Without the worry of incompatibility, individuals can use Linux operating system on any device. It runs the same way on both high-end and low-end hardware.

# Free and Open-Source

Its source code is available for anybody to use and alter. Many developers collaborate in organizations to improve and strengthen Linux, and lots of developers constantly work on updating the Linux system.

# Shell/ Command-line Interface

The Linux system includes essential programs that users can utilize in order to issue commands to the operating system for executing the design flawlessly. You may also direct it to carry out various forms of commands for effectively carrying out the applications.

# End-to-end encryption/ Security

Authentication can help you keep your data protected. Before you may access some critical files, the Linux Operating System requires you to enter a password. Furthermore, the Linux environment allows users to encrypt their data.

# Graphical User Interface (GUI)

Linux Operating System comes with Graphical User Interface (GUI) abilities in the same way you can with Windows. Similarly, users can install the programs, and the computer graphics will begin to work in the same way that Windows does.

# Keyboard Support

Because Linux is available in various languages, it is simple to use it worldwide. As a result, you can change the language on your keyboard as per your preference.

1. **Multitasking:** More than one function can be performed simultaneously by dividing the CPU time intelligently.
2. **Live CD/USB:** Almost all Linux distros provide live CD/USB so that users can run/try it without installing it.
3. **Graphical User Interface (X Window system):** Linux is command line-based OS but it can be converted to GUI based by installing packages.
4. **Support's customized keyboard:** As it is used worldwide, hence supports different languages keyboards.
5. **Application support:** It has its own software repository from where users can download and install many applications.
6. **File System:** Provides hierarchical file system in which files and directories are arranged.
7. **Open Source:** Linux code is freely available to all and is a community-based development project

# Installing Linux Operating System

We can install Linux OS in the three following ways-

1. Install Ubuntu inside a virtual Box in windows
2. Dual boot Ubuntu with windows.
3. Replace windows and install Ubuntu

# Install Ubuntu inside a VirtualBox in windows

[VirtualBox](https://www.virtualbox.org/) is free and open-source virtualization software from Oracle. It enables you to install other operating systems in virtual machines. system should have at least 4GB of RAM to get good performance from the virtual operating system.

# Requirements

* + Good internet connection to download software and Linux ISO.
  + Windows system with at least 40 GB of free space.
  + Windows system with 4GB of RAM.
  + Make sure to enable virtualization in the BIOS

# Steps for installation of Linux in Virtual Box

**Step 1: Download and install VirtualBox** [**https://www.virtualbox.org/wiki/Downloads**](https://www.virtualbox.org/wiki/Downloads)

**Step 2: Download the Linux ISO** [**https://releases.ubuntu.com/18.04/**](https://releases.ubuntu.com/18.04/)

**Step 3: Install Linux using VirtualBox**

For Further steps click on the below icon-link and follow the steps given in the presentation-



**Output:** VirtualBox with Linux OS

# Conclusion:

**Post Lab Questions:**

1. Discuss the various features of Linux.
2. List the different OS for PC and compare the Linux OS with Windows OS.