*Operating System Lab Assignment I*

*4ITRC2*

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*BE II Year*

*Information Technology - ‘A’*

**Aim: To install and study Ubuntu OS**

**To perform: Install VMware or Virtual Box and Ubuntu over Windows OS**

**To Submit: Study of Ubuntu OS**

1. Introduction (in brief about linux and ubuntu, its versions + some history)

2. Features of Ubuntu

3. Difference between ubuntu and windows OS.

## **1. Introduction to Linux and Ubuntu**

Linux is an open-source, Unix-like operating system kernel that serves as the foundation for many different operating systems, known as distributions (distros). One of the most popular Linux distributions is **Ubuntu**, which is developed and maintained by **Canonical Ltd**.

### **Ubuntu: Overview and History**

Ubuntu was first released in **2004** by Canonical, with the goal of providing a free, user-friendly, and secure operating system. It is based on **Debian**, another popular Linux distribution. Ubuntu releases new versions every **six months**, with Long-Term Support (LTS) versions released every **two years**, ensuring stability and extended security updates.

### **Versions of Ubuntu**

Ubuntu releases two types of versions:

1. **Long-Term Support (LTS) Versions** – Released **every two years**, supported for **5 years** (or **10 years** with Ubuntu Pro). LTS versions focus on stability and security, making them ideal for servers and enterprises.
2. **Regular (Non-LTS) Versions** – Released **every six months**, supported for **9 months**. These versions include the latest features but are less stable than LTS.

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### **Latest Ubuntu Versions**

| **Version** | **Release Date** | **Support Until** | **Type** |
| --- | --- | --- | --- |
| **Ubuntu 24.04 LTS** (Noble Numbat) | April 2024 | April 2029 (2034 with Pro) | LTS |
| Ubuntu 23.10 (Mantic Minotaur) | October 2023 | July 2024 | Regular |
| **Ubuntu 22.04 LTS** (Jammy Jellyfish) | April 2022 | April 2027 (2032 with Pro) | LTS |
| Ubuntu 21.10 (Impish Indri) | October 2021 | July 2022 | Regular |
| **Ubuntu 20.04 LTS** (Focal Fossa) | April 2020 | April 2025 (2030 with Pro) | LTS |

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### **Ubuntu Flavors (Variants)**

Ubuntu also comes in different desktop environments for different user needs:

* **Kubuntu** – Uses KDE Plasma desktop
* **Xubuntu** – Lightweight, uses Xfce
* **Lubuntu** – Super lightweight, uses LXQt
* **Ubuntu MATE** – Classic GNOME 2 look
* **Ubuntu Budgie** – Uses the modern Budgie desktop
* **Ubuntu Studio** – Optimized for creative professionals (audio/video editing)

## **2. Features of Ubuntu**

Ubuntu offers several powerful features that make it a preferred choice for many users:

### **a) Free and Open-Source**

Ubuntu is **completely free** to use, modify, and distribute. It also benefits from contributions from the open-source community.

### **b) Security and Stability**

Ubuntu provides strong security with:

* Regular updates
* Built-in firewall and encryption
* Minimal risk of viruses compared to Windows

### **c) User-Friendly Interface**

The **GNOME** desktop environment (default in Ubuntu) offers a clean and modern UI. Other desktop options are also available via Ubuntu flavors.

### **d) Software Availability**

Ubuntu comes with a package manager called **APT (Advanced Package Tool)** and allows easy software installation using the **Snap Store** and **Flatpak**. Popular applications like **LibreOffice, Firefox, and VLC** are pre-installed.

### **e) Performance and Efficiency**

Ubuntu is lightweight and can run efficiently on older hardware, unlike Windows, which often requires high system resources.

### **f) Customization and Developer-Friendly**

Ubuntu supports extensive customization and is widely used for software development, thanks to:

* Pre-installed **compilers** (GCC, Python, Java)
* Command-line utilities
* Built-in support for **virtualization and containers** (Docker, Kubernetes)

## **3. Ubuntu vs Windows: Key Differences**

| **Feature** | **Ubuntu** | **Windows** |
| --- | --- | --- |
| **Cost** | Free and open-source | Paid (except Windows 11 upgrade) |
| **Security** | More secure (fewer viruses) | More vulnerable to malware |
| **Customization** | Highly customizable | Limited customization |
| **User Interface** | GNOME, KDE, etc. (multiple UIs) | Standard Windows UI (Explorer) |
| **Software Management** | Uses APT, Snap, and Flatpak | Uses .exe, Microsoft Store |
| **Performance** | Lightweight, runs on old PCs | Requires more system resources |
| **Gaming Support** | Limited but improving (via Steam, Proton) | Extensive gaming support |
| **Developer Tools** | Preferred for programming, Linux servers | More user-friendly for non-tech users |
| **File System** | Uses ext4, Btrfs, ZFS | Uses NTFS, FAT32 |