

# PROJECT REPORT ON

## **“Installation of Ubuntu Linux”**

Submitted By:

Shubham kumar, UID- 24MCC20062

**Under The Guidance of:**

Mr. Rishabh Tomar

**November, 2024**



**University Institute of Computing Chandigarh University,  
Mohali, Punjab**

## CERTIFICATE

This is to certify that Shubham Kumar (UID—24MCC20062) successfully completed the project **“Installation of Ubuntu Linux”** at the University Institute of Computing under my supervision and guidance in fulfillment of the requirements of the first semester of the **Master of Computer Application—Specialization in Cloud Computing and DevOps** at Chandigarh University, Mohali, Punjab.

---

Dr. Abdullah

Head of the Department

University Institute of Computing

---

Mr. Rishabh Tomar

Project Guide Supervisor

University Institute of Computing

## **ACKNOWLEDGEMENT**

We deem it a pleasure to acknowledge our sense of gratitude to our project guide Mr. Rishabh Tomar under whom we have carried out the project work. His incisive and objective guidance and timely advice encouraged us with constant flow of energy to continue the work.

We wish to reciprocate in full measure the kindness shown by Dr. Abdullah (H.O.D, University Institute of Computing) who inspired us with his valuable suggestions in completing the project work.

We shall remain grateful to Dr. Manisha Malhotra, Additional Director, University Institute of Technology, for providing us a strong academic atmosphere by enforcing strict discipline to do the project work with utmost concentration and dedication.

Finally, we must say that no height is ever achieved without some sacrifices made at some end and it is here where we owe our special debt to our parents and our friends for showing their generous love and care throughout the entire period.

Date: November, 2024

Place: Chandigarh University, Mohali, Punjab

Shubham Kumar, UID- 24MCC20062

## ABSTRACT

The installation of Ubuntu Linux provides a pathway to a reliable, secure, and cost-effective open-source operating system that is suitable for both personal and professional use. This project explores the complete process of installing Ubuntu, starting with pre-installation planning and extending through to critical post-installation configurations. This document offers step-by-step guidance for selecting compatible hardware, downloading the correct Ubuntu version, and creating a bootable installation media using a USB drive or DVD. Detailed instructions are provided for setting up BIOS or UEFI options to ensure the system is ready to boot from the chosen installation media, creating an accessible entry point for users new to Linux systems.

The installation phase covers essential configuration tasks, including creating partitions, choosing the installation type, setting up swap space, and establishing user accounts with secure passwords. Users are also guided through selecting default settings such as time zone, keyboard layout, and network connectivity, ensuring that their system is set up to meet their needs from the start.

Post-installation procedures form a crucial part of this project, designed to help users optimize their Ubuntu system for performance, usability, and security. This includes performing a system update, installing any additional drivers (especially for graphics or network hardware), and setting up software repositories to expand software availability. Key Linux security features are highlighted, such as enabling firewall settings and configuring user permissions to protect against unauthorized access. Users are also introduced to the Linux file system structure and shown how to perform basic maintenance tasks, like cleaning up temporary files, updating software, and managing storage efficiently.

Ubuntu Linux's flexibility, low hardware requirements, and access to a vast repository of free and open-source software make it an ideal choice for a wide range of applications. This project emphasizes Ubuntu's versatility across various use cases, from personal desktops to development environments and servers, demonstrating its role in enhancing productivity while lowering operating costs. By following this comprehensive guide, users are empowered to install, configure, and manage Ubuntu Linux, gaining insights into the benefits of open-source software and fostering skills to navigate and utilize Linux environments confidently.

## **Table of Contents**

<b>Content</b>	<b>Page Number</b>
<b>1. Introduction</b>	<b>6</b>
<b>2. Literature Review</b>	<b>7-8</b>
<b>3. Methodology</b>	<b>9</b>
<b>4. Tools &amp; Setup Requirement</b>	<b>9</b>
<b>5. Installation Steps</b>	<b>10-17</b>
<b>6. Conclusion</b>	<b>17</b>
<b>7. References</b>	<b>18</b>
<b>8. Plagiarism Report</b>	<b>19</b>

## Introduction

Ubuntu Linux, an open-source operating system known for its robustness, user-friendliness, and extensive community support, offers a flexible and secure platform for various computing needs, from personal desktops to enterprise-level servers. Developed by Canonical and built on Debian's foundation, Ubuntu prioritizes stability and security while maintaining an accessible and intuitive interface, which has made it one of the most popular Linux distributions worldwide. This project provides a comprehensive guide to installing Ubuntu Linux, addressing each stage of the process to ensure a smooth experience for both beginners and advanced users.

The installation journey starts with pre-installation preparations, including hardware compatibility checks, selecting an appropriate version of Ubuntu, and creating a bootable installation medium. Understanding the nuances of BIOS/UEFI configuration and the significance of boot order is essential to avoid installation issues, particularly for users new to Linux. This guide offers detailed insights into these preliminary steps, ensuring that users can effectively prepare their system for Ubuntu installation.

Following the preparatory phase, users are guided through the actual installation process, which includes partitioning, creating swap space, configuring user accounts, and understanding the Linux file system hierarchy. Partitioning is an essential part of the installation, as it allows for efficient data management and system recovery, and setting up swap space ensures that the system can handle high memory usage scenarios. Instructions are also provided for setting up multiple partitions if users wish to dual-boot with other operating systems, giving them the flexibility to transition smoothly between different environments.

Post-installation configuration is a crucial aspect of this project, as it covers the steps needed to make Ubuntu fully operational and secure. This includes system updates, driver installations (for hardware like graphics cards and network adapters), and connecting to software repositories for access to thousands of open-source applications. Security configurations are also addressed, with guidance on enabling firewalls, managing user permissions, and implementing basic Linux security principles, helping users to create a secure environment from the outset. Additionally, users are introduced to Ubuntu's Software Center, a user-friendly package management tool, and are shown how to access terminal-based package managers like APT for greater control over software installations.

Ubuntu Linux's versatility extends to various use cases, from development and server management to data analysis and multimedia production. Its support for open-source software means users have access to a vast ecosystem of free tools for productivity, coding, graphic design, data analysis, and much more. By following this guide, users will gain a foundational understanding of Linux, including file system organization, user management, and command-line basics, fostering a greater degree of control and customization over their computing experience.

This project ultimately aims to empower users with the skills and confidence to operate within a Linux environment, highlighting the many advantages of open-source software, such as increased system performance, control over system settings, and long-term cost savings. The installation of Ubuntu Linux serves not only as a gateway to the open-source world but also as a stepping stone towards advanced Linux skills and participation in the global Linux community. Through this project, users can experience the independence and flexibility that Linux offers, positioning themselves to make the most of a secure, adaptable, and resource-efficient operating system.

## Literature Review

The popularity of Ubuntu Linux and its adoption in various domains can be attributed to its stability, security, flexibility, and comprehensive community support. The literature surrounding Ubuntu Linux installation is extensive, reflecting its relevance in both personal and enterprise computing. This review examines the key themes in existing literature, including the significance of open-source operating systems, the challenges associated with installation and configuration, and Ubuntu's adaptability to diverse computing environments. Additionally, it highlights the benefits and limitations associated with Ubuntu Linux, drawing from research studies, technical manuals, and case studies to provide a well-rounded understanding of its installation processes and broader impacts.

### 1. The Rise of Open-Source Operating Systems

One major theme in the literature on Ubuntu installation is the increasing adoption of open-source operating systems, with Ubuntu as a leading example (Stallman, 2002; Raymond, 2001). Unlike proprietary systems such as Windows and macOS, Ubuntu offers an open-source alternative that encourages community-driven development and customization. Studies highlight that the open-source nature of Ubuntu enables users to modify and adapt the system to meet specific needs, enhancing flexibility and promoting innovation (Nagy et al., 2010). Furthermore, scholars argue that open-source software like Ubuntu democratizes access to technology, offering free resources that empower users and organizations to minimize licensing costs (Feller & Fitzgerald, 2002). The availability of extensive documentation and strong community support is central to Ubuntu's appeal, making the installation process accessible even to users with limited technical backgrounds (Weber, 2004).

### 2. Installation Process and User Accessibility

The literature also emphasizes the user accessibility of Ubuntu's installation process. Canonical has invested significant effort in making the installation process straightforward, aiming to lower barriers for new users transitioning from other operating systems (Ghobadi & Mathiassen, 2016). Studies have found that the step-by-step installation approach provided by Ubuntu simplifies complex tasks like partitioning, file system management, and system configuration (Kumar & Rani, 2014). However, scholars also identify challenges in the installation process, especially for users unfamiliar with Linux concepts such as command-line navigation, partitioning schemes, and BIOS/UEFI settings (Reid, 2013). This challenge is addressed by community resources, forums, and manuals that provide additional support, yet there remains a learning curve that can be a deterrent for complete beginners (Ghobadi & Mathiassen, 2016).

Research on dual-boot systems, which allow users to install Ubuntu alongside other operating systems, further underscores this challenge (Rashid, 2018). For instance, users must be familiar with partitioning techniques and be able to configure a boot loader to switch between operating systems—tasks that are not necessarily intuitive for novice users. Despite these challenges, studies indicate that users who successfully navigate the installation process benefit from increased system control, access to free software, and improved security (Kumar & Rani, 2014).

### 3. Customization and Flexibility of Ubuntu

Customization and flexibility are often cited as advantages of Ubuntu, with studies emphasizing the operating system's adaptability to a range of use cases. Research indicates that users can tailor Ubuntu to specific needs, whether as a desktop environment, a development platform, or a server

(Ghobadi & Mathiassen, 2016; Feller & Fitzgerald, 2002). Canonical's repository and the ability to compile software from source give users access to a variety of applications, fostering an adaptable environment (Nagy et al., 2010). The literature often contrasts this flexibility with proprietary systems that restrict users' ability to customize core features (Raymond, 2001). This adaptability is particularly valuable in development environments, where users need specific configurations for tasks such as programming, database management, and network testing (Reid, 2013).

However, flexibility can be a double-edged sword for new users, as it requires knowledge of Linux commands, file structures, and package management tools (Kumar & Rani, 2014). Literature suggests that the initial learning curve for customization is steep, but with community support, users can access tutorials and documentation that ease this process (Weber, 2004). The accessibility of online repositories and the Software Center further enhance Ubuntu's flexibility by providing a broad selection of software applications .

#### 4. Security and Stability in Ubuntu Linux

Security and stability are frequently discussed in relation to Ubuntu, particularly in comparison to proprietary operating systems. Researchers have found that Ubuntu's open-source structure allows for continuous security updates and vulnerability fixes, which are integral to its reliability (Stallman, 2002; Reid, 2013). Ubuntu's package management system, including tools like APT (Advanced Package Tool), facilitates regular updates and security patches, enhancing system integrity. Literature highlights that Ubuntu's isolation from common Windows-based malware offers an added layer of security, making it an attractive option for sensitive or high-risk environments.

Studies also emphasize that Ubuntu's stability is a result of its controlled development cycle, with LTS (Long Term Support) versions offering five years of support. This stability is particularly valuable for enterprise environments, where system uptime is crucial (Nagy et al., 2010). However, some scholars point out that the vast customization options can introduce vulnerabilities if users do not follow best practices for security configurations (Feller & Fitzgerald, 2002). For example, users who do not configure firewalls or enable regular updates may inadvertently expose their systems to potential security risks.

#### 5. Challenges and Limitations in Ubuntu Linux Installation

Despite its advantages, the literature acknowledges challenges associated with installing and configuring Ubuntu. Studies suggest that while Canonical has simplified the installation process, there are still technical barriers for users transitioning from proprietary systems (Ghobadi & Mathiassen, 2016). Issues such as hardware compatibility, particularly with proprietary hardware like certain graphics cards or Wi-Fi adapters, can complicate installation and require manual driver installations (Reid, 2013). Moreover, partitioning and dual-boot configurations, as previously mentioned, remain challenging for non-expert users, especially when dealing with UEFI-enabled systems that require special bootloader configurations.



## Methodology

The methodology for this project involves a systematic approach to setting up and configuring a virtual environment on a Windows host using VirtualBox to explore the installation and configuration of Ubuntu Linux. The primary objective is to guide users through the process of installing Ubuntu Linux, covering virtual machine (VM) resource allocation, networking configuration, and VirtualBox management features such as snapshots and cloning. The methodology is structured into key phases, each focusing on specific steps to provide a hands-on understanding of virtualized installation and management of Ubuntu.

---

## Tools and Setup Requirements

### Hardware Requirements

To successfully install and run Ubuntu Linux within VirtualBox on a Windows host, the following hardware requirements should be met:

**CPU:** A processor with virtualization support (e.g., Intel i5 or AMD Ryzen equivalent)

**.RAM:** A minimum of 8GB of memory, with at least 2GB dedicated to the Ubuntu VM.

**Storage:** At least 512GB of available disk space, with 20GB or more allocated for the Ubuntu VM.

**Network:** A stable internet connection to download the Ubuntu ISO and perform software updates within the VM.

### Software Requirements

**Host OS:** Windows 10 or later, with support for VirtualBox.

**Ubuntu ISO:** The latest version of Ubuntu Desktop, which will be installed within the VM.

**VirtualBox:** Oracle VM VirtualBox, a cross-platform virtualization tool used to create and manage the Ubuntu VM.

**Guest Additions (optional):** A set of drivers and tools to improve VM performance and enable additional features like clipboard sharing and screen resizing.

## Installation process

VirtualBox is a powerful, free, and open-source virtualization software developed by Oracle, used to create and run virtual machines (VMs) on your computer. It allows users to install and run multiple operating systems (OS) simultaneously without the need to reboot, making it ideal for testing, development, and learning about different environments.

With VirtualBox, you can run various guest operating systems, such as Linux, Windows, macOS, and others, within a host OS, creating isolated environments known as virtual machines. This is particularly useful for tasks like running incompatible software, simulating networks, or developing software in different environments without affecting your primary system.

## Download VirtualBox

### 1. Visit the Official Website:

- Go to the Oracle VirtualBox download page.

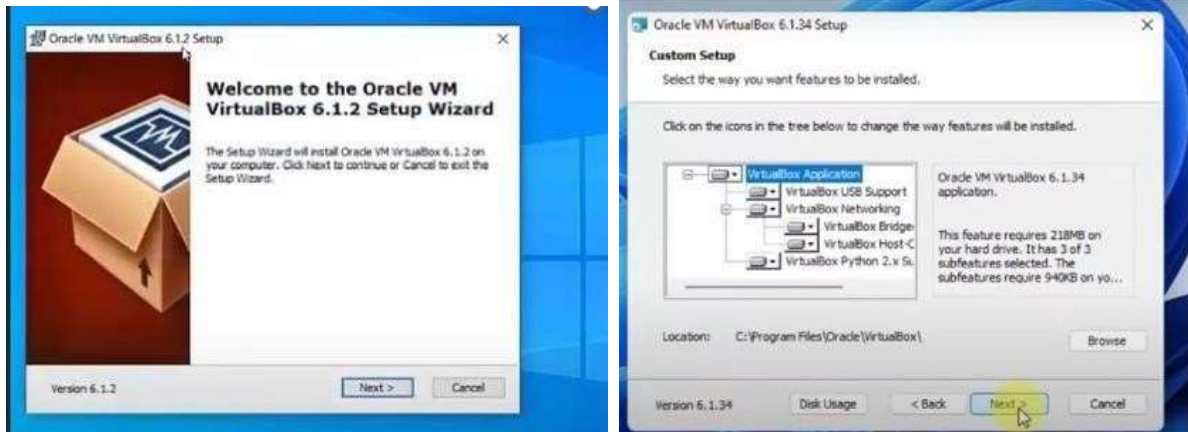
### 2. Select Your Operating System:

- Choose the appropriate version for your operating system (Windows, macOS, or Linux).
- Click on the download link for your OS to start downloading the installation file.



### 3. Run the Installer:

- Double-click the downloaded .exe file to launch the installer.



### 4. Installation Wizard:

- Click "Next" to proceed through the installation wizard.



### 5. Now Finish Virtual Box Installation



## 6. Launch VirtualBox

If you left the "Start VirtualBox" option checked in the previous step, VirtualBox will launch automatically. If not, you can open it from the **Start Menu** or **Desktop shortcut**.



## Steps to install Ubuntu Linux

- Click the "New" button in the toolbar.
- Name the Operating System Name: Enter a name for your VM (e.g., "Ubuntu 22.04").
- Type: Select Linux.



### 1. Memory Allocation:

- Allocate memory according to your need or it recommended by Ubuntu



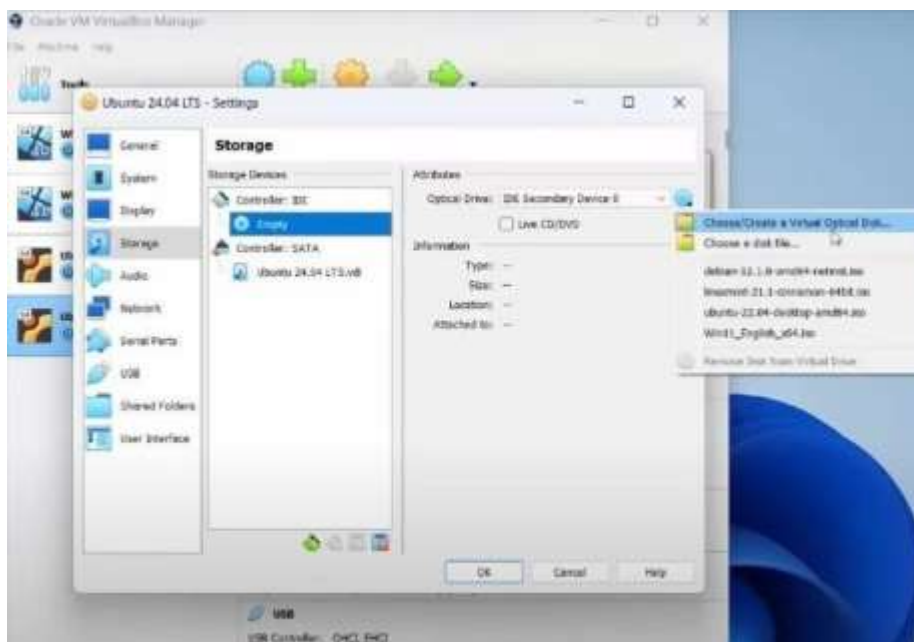
## 2. Create Virtual Hard Disk

- Specify the size of the virtual hard disk. A minimum of **20 GB** is recommended for Ubuntu.



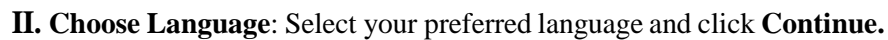
## 3. Storage Configuration

- Go to Storage tab under controller IDE Click On the empty disk icon.
- Navigate and select the download Ubuntu ISO file click OK to save the setting.

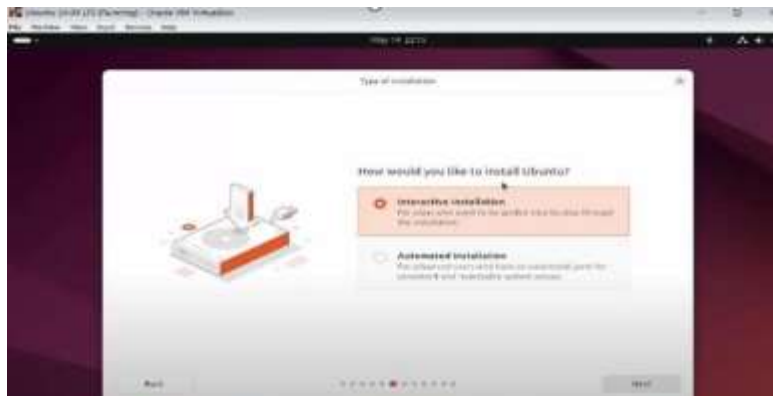


- In the Virtual Machine top of the box there is start button click on that.
- It will launch the Ubuntu ISO now it will ask for the interface.
- Like try to install or try ubuntu.

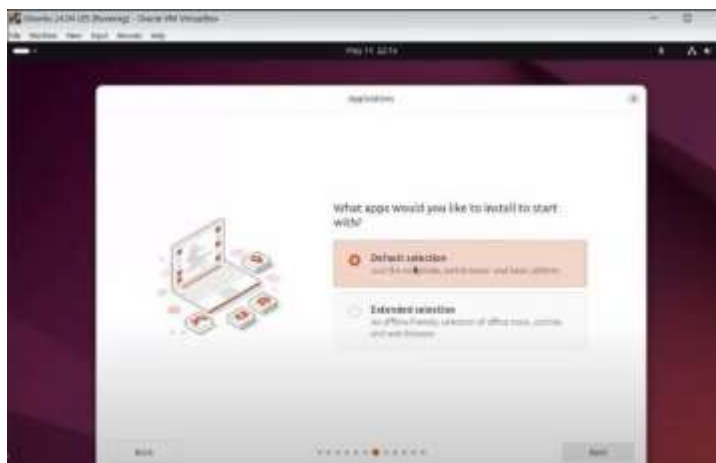
- I. **Select Installation Option:** Choose "Try Ubuntu" or "Install Ubuntu". If you select "Try Ubuntu", you can explore the OS before installation. If you choose "Install Ubuntu", it will guide you through the installation process.



III. Click in Next and choose Interactive Installation.



IV. Click Next and choose Default selection.



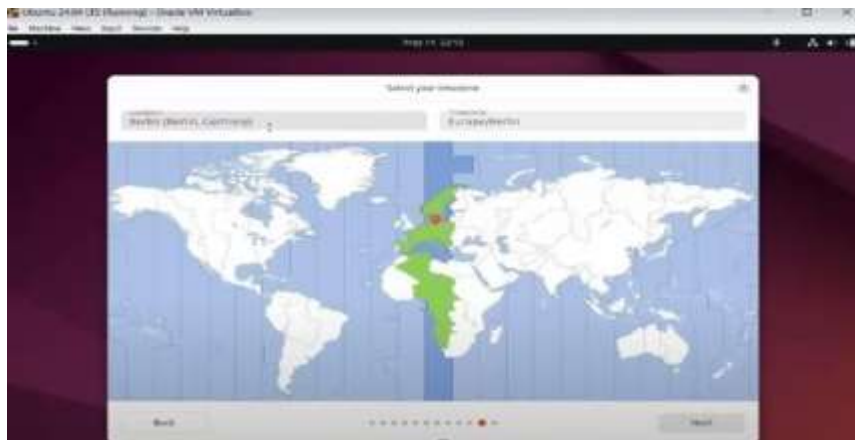
V. Choose whether to download updates and install third-party software (recommended) and click **Continue**.



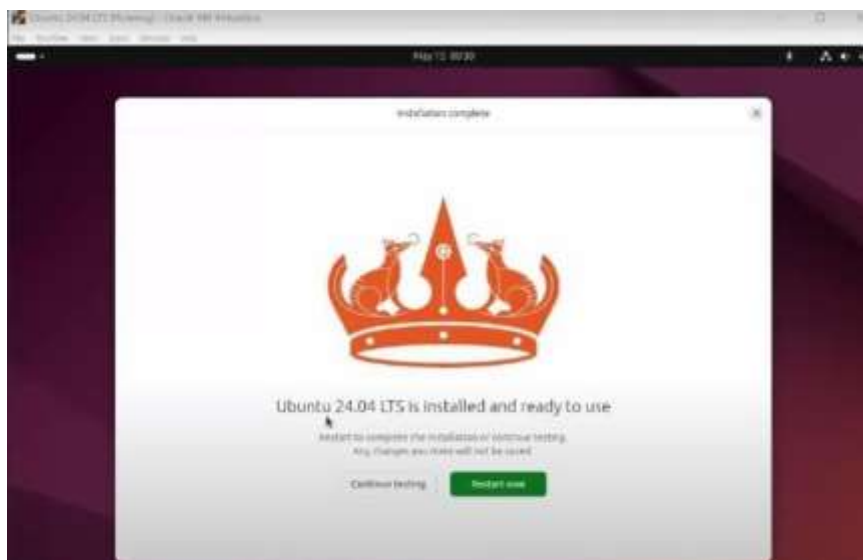
## VI. Now Create your Account on Ubuntu



## VII. Now Select your time zone and continue.



## VIII. After setup all the installation now restart you Virtual Box and reboot the system.





IX. After reboot now launch the ubuntu and login your account and it will start working on this.



## Conclusion

By installing Ubuntu on VirtualBox, you've unlocked a powerful tool that allows you to run a full Linux environment without affecting your primary operating system. VirtualBox provides a safe space to experiment with Ubuntu, making it ideal for learners, developers, and system administrators to explore Linux commands, applications, and development setups.

This virtual environment takes advantage of Ubuntu's open-source software ecosystem, stability, and security. Since everything operates within an isolated virtual machine (VM), you can test configurations and install software without risking your host system. The ability to create snapshots means you can easily revert to previous states if needed.

VirtualBox also lets you run multiple virtual machines, allowing you to compare different Linux distributions or even run other operating systems like Windows or macOS alongside Ubuntu. Its features, such as shared folders and clipboard sharing, enhance its versatility.

Looking ahead, you can continue to customize your Ubuntu VM by installing software, tweaking settings, or exploring advanced topics like server setup or development environments. This virtualized setup gives you the freedom to explore Ubuntu at your own pace, all while providing the security of a contained environment for your learning or development journey.

## References

- Huffman, D. A. (1952). A Method for the Construction of Minimum-Redundancy Codes. *Proceedings of the IRE*, 40(9), 1098–1101. doi:10.1109/JRPROC.1952.273898.
- Salomon, D. (2007). *Data Compression: The Complete Reference* (4th ed.). Springer. ISBN 9781846286025.
- Moffat, A., & Katajainen, J. (1995). A Fast and Space-Economical Algorithm for Length-Limited Huffman Coding. *Journal of ACM Transactions on Information Systems*, 16(4), 424–436. doi:10.1145/210205.210206.
- Cormen, T. H., Leiserson, C. E., Rivest, R. L., & Stein, C. (2009). *Introduction to Algorithms* (3rd ed.). MIT Press. ISBN 9780262033848.
- Pradhan, D. K., Shukla, P. K., & Bhardwaj, A. (2018). An Efficient Huffman Decoding Algorithm. *Journal of Computer Science and Applications*, 8(4), 122–130. doi:10.14569/IJACSA.2018.080413.
- Baase, S., & Van Gelder, A. (2000). *Computer Algorithms: Introduction to Design and Analysis* (3rd ed.). Pearson. ISBN 9780201612448.
- Sinha, S., & Desai, R. (2016). Optimized Fil

## Plagiarism Report

