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## **Practicum 1**

**Question :**

### **1. What is a Virtual Machine?**

Virtual Machine (VM) is a computer resource that uses software instead of a physical computer to run programs and deploy apps. One or more virtual "guest" machines run on a physical "host" machine. Each virtual machine runs its own operating system and functions separately from the other VMs, even when they are all running on the same host.

### **2. Name the types of Operating System and their advantages and disadvantages?**

#### **a. Batch Operating System**

A batch operating system is the most suited operating system to use in lengthy and time-consuming tasks. A computing system has various tasks to perform at the same time.

**Advantage :**

- The batch operating system consists of a job scheduler, which is responsible for organizing and prioritizing tasks based on the requirements and system resources.
- Efficient in processing large tasks.
- Reduces CPU idle time by grouping similar jobs.

**Disadvantage :**

- Since batch operating system takes up relatively up jobs that are bigger in nature, the completion and submission of the jobs also take up quite more time than usual.
- No direct user interaction.
- Debugging errors is difficult.

#### **b. Multi-programming Batched System**

In a multi-programming batched system, the operating system reads and tries to store the maximum memory of the tasks assigned.

**Advantage :**

- The multi-programming batched system improves the efficiency of the job assigned by reducing idle time as it takes up another job if the last job requires help
- Efficiently manages CPU, memory, and input/output resources.
- Multiple programs run simultaneously, improving system throughput.

**Disadvantage :**

- Multi-programming batched systems are responsible for the concurrent working of the jobs and hence such programming adds complexity to the implementation.
- Needs more memory and storage for efficient multitasking.
- Users cannot interact with their jobs once submitted, as execution is automatic.

**c. Time Sharing Operation System**

A time-sharing operating system is also called a Multi-tasking system. The time-sharing operating system works by allocating time to a batch of tasks and switching between tasks frequently.

**Advantage :**

- Time-sharing operating systems enable users to access the system through different remote locations.
- Maximizes CPU usage by switching between tasks.
- Provides a user-friendly experience with real-time interaction.

**Disadvantage :**

- The complex nature of the time-sharing operating system due to its concurrent processes, and scheduling algorithms can make troubleshooting more challenging.
- High resource consumption.
- Security risks due to multiple users accessing the system.

**3. List the advantages of Windows and Linux OS****a. Windows :**

- User-Friendly Interface
- Software Compatibility
- Plug and Play Support
- Pre-installed on many devices
- Large range of software

## **b. Linux OS**

- Mostly open source
- Very stable
- Extensive configuration possibilities
- No Forced Updates
- Highly Secure

## **4. Name and explain the steps taken by a computer when it first starts up!**

### **a. Power On & Power-On Self-Test (POST)**

- The BIOS (Basic Input/Output System) or UEFI (Unified Extensible Firmware Interface) firmware runs a Power-On Self-Test (POST) to check hardware components like RAM, CPU, storage devices, and keyboard.
- If errors are found (e.g., missing RAM or faulty hardware), the system may beep or display error messages.

### **b. Load BIOS/UEFI Firmware**

- After POST, the BIOS/UEFI firmware initializes system settings and detects connected storage devices (HDD/SSD).
- The boot order is checked to determine where to load the OS from (e.g., hard drive, USB, or network).

### **c. Locate and Load Bootloader**

- The BIOS/UEFI searches for the bootloader (e.g., Windows Boot Manager or GRUB for Linux) in the storage device.
- The bootloader is a small program that loads the operating system kernel.

### **d. Load Operating System Kernel**

- The bootloader loads the OS kernel (the core of the operating system) into RAM.
- The kernel initializes hardware drivers and system processes needed for the OS to function.

### **e. Initialize System Processes & User Interface**

- The OS starts essential background services (like file system management and network services).
- The Graphical User Interface (GUI) or Command Line Interface (CLI) is loaded.
- The user login screen appears, allowing access to the system.

### **f. User Login & System Ready**

- The user enters login credentials.
- User-specific settings and applications load, and the system becomes fully operational.

## 5. Describe the types of software that you are familiar with!

- a. System Software : Manages hardware and provides a platform for other software.
- b. Application Software : Designed for end-users to perform specific tasks.
- c. Programming Software : Tools used by developers to write, test, and debug programs.

## 6. Explain what an operating system is!

An Operating System (OS) is system software that acts as an interface between computer hardware and users. It manages hardware resources and provides a platform for running applications.

## 7. Name the operating systems you know and explain them!

- a. Windows OS : A user-friendly OS with a **Graphical User Interface (GUI)**, widely used for personal and business computers.
- b. Mac OS : Exclusive to Apple devices (MacBooks & iMacs), macOS is known for its smooth performance and security.
- c. Linux OS : A powerful and flexible OS used for servers, programming, and cybersecurity
- d. Android OS : A mobile OS used in smartphones, tablets, and smart devices.
- e. iOS : A mobile OS used exclusively in iPhones and iPads.

## 8. Explain what an operating system is for!

### Hardware Management

- Controls and coordinates the CPU, memory, storage, and input/output devices.
- Ensures efficient use of system resources.

### Process Management

- Manages running applications and background processes.
- Supports multitasking by switching between tasks efficiently.

### Memory Management

- Allocates RAM to active programs and ensures optimal performance.
- Prevents memory leaks and manages virtual memory.

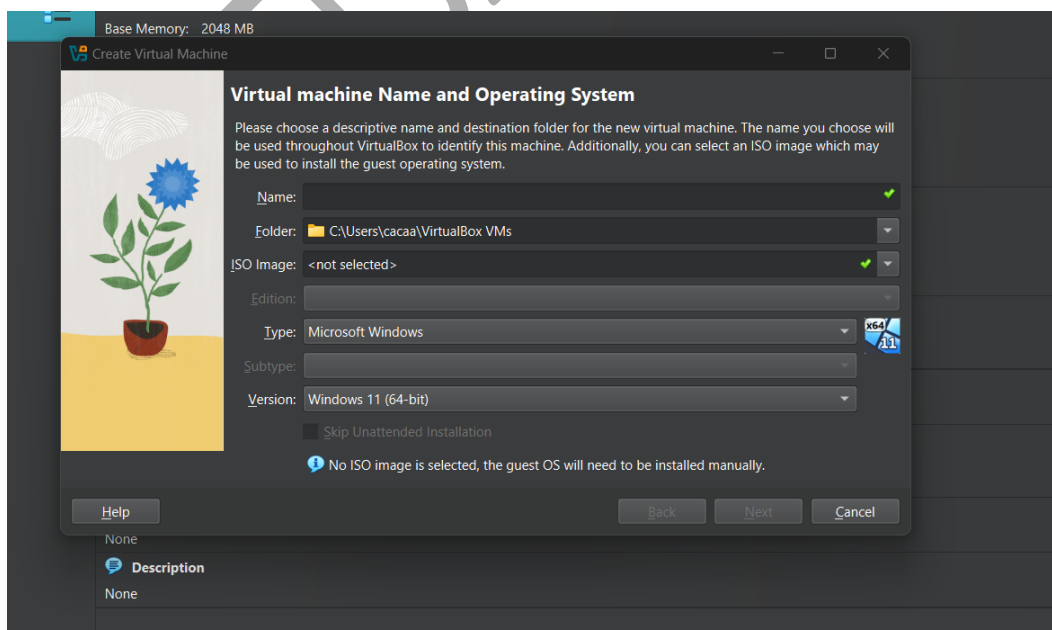
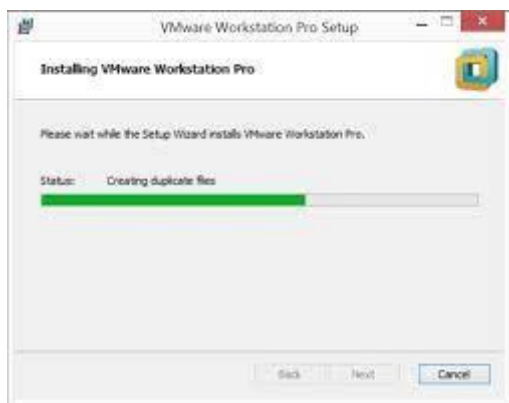
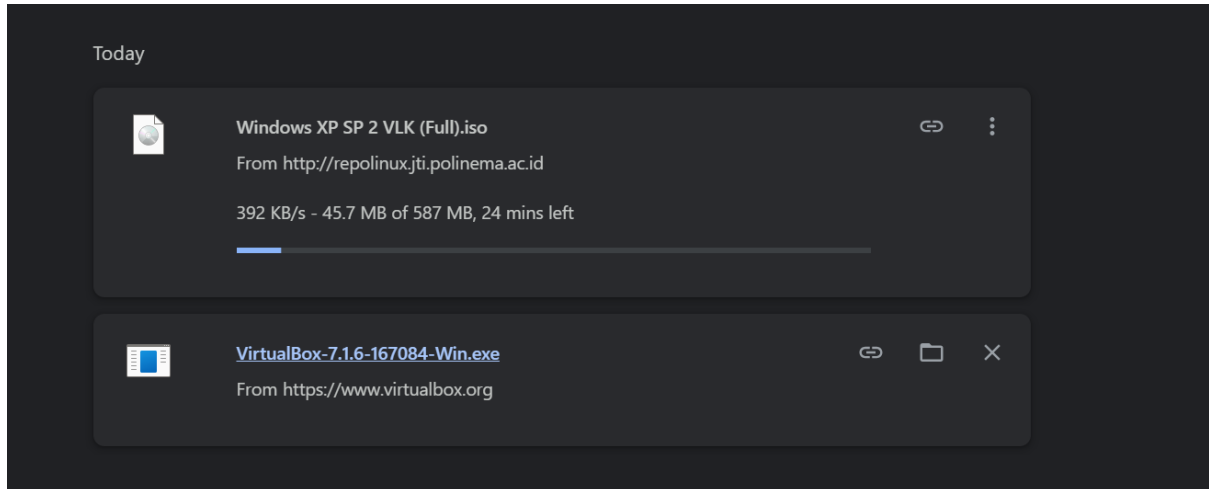
### File System Management

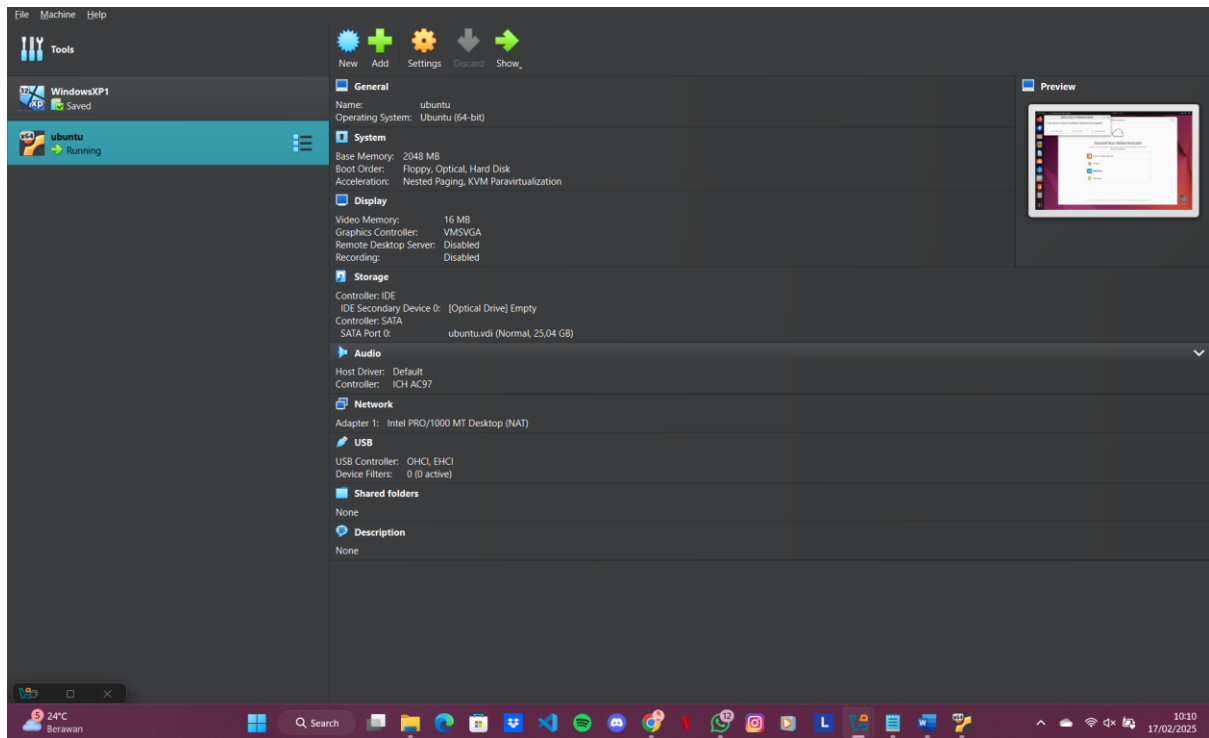
- Organizes, stores, and retrieves files on storage devices.
- Provides file access permissions and security.

## Official Report :

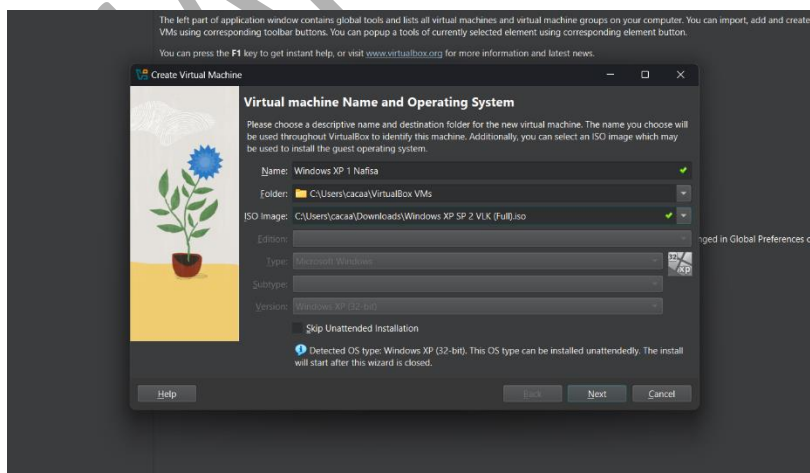
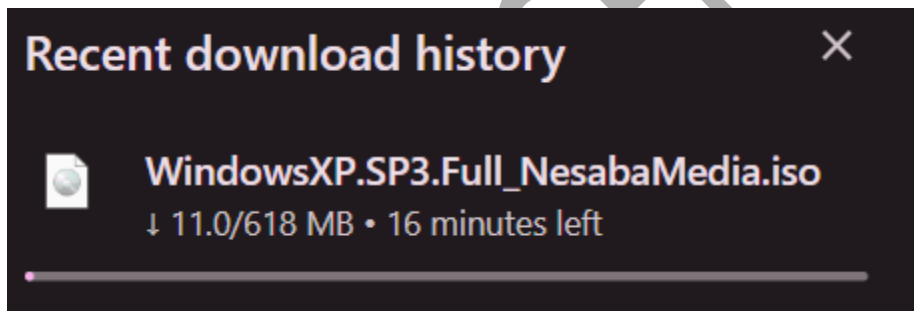
1. Make a summary of VMWare installation along with Windows and Linux OS, screenshots of how to install VMWare and install Windows and Linux OS.

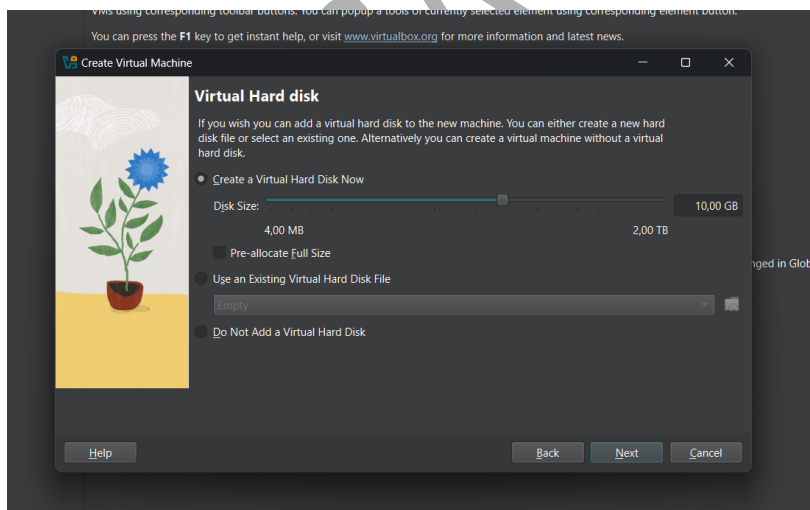
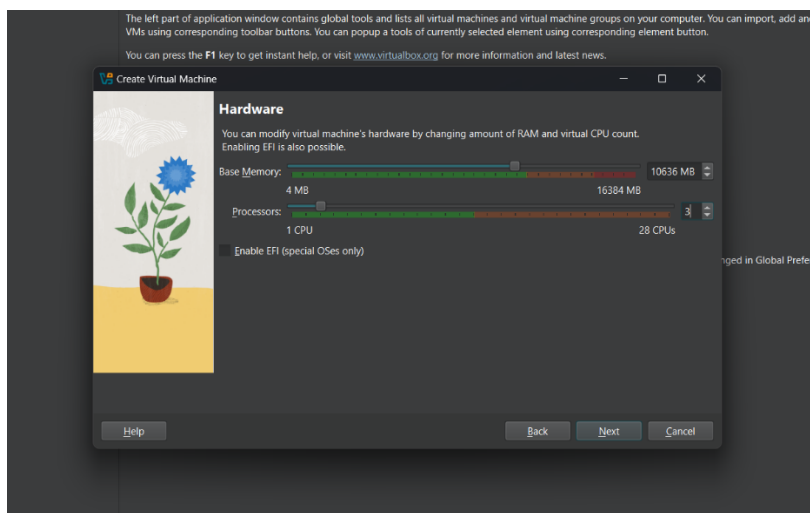
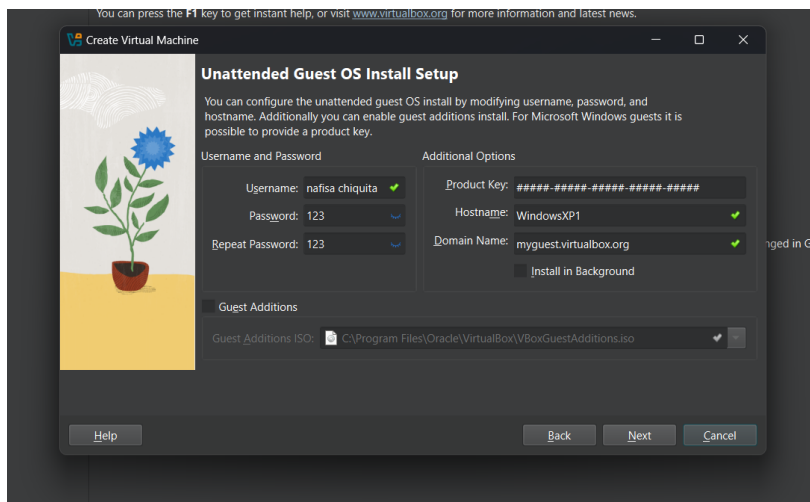
VM ware :





For windows XP :

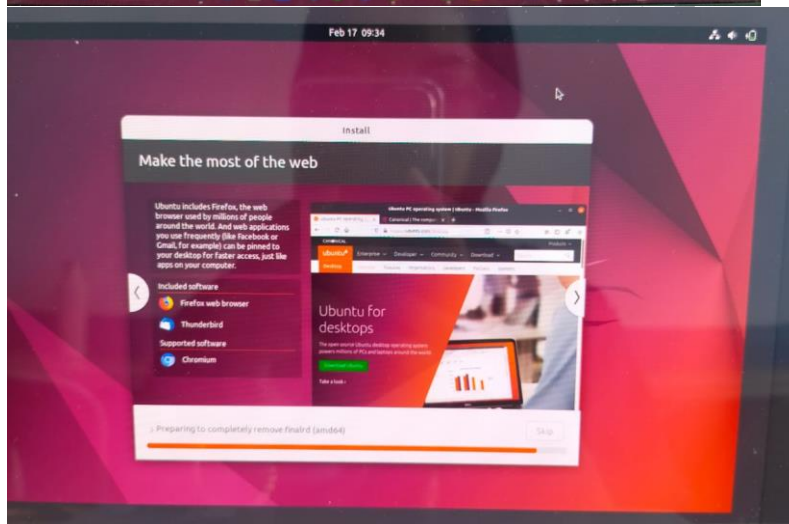
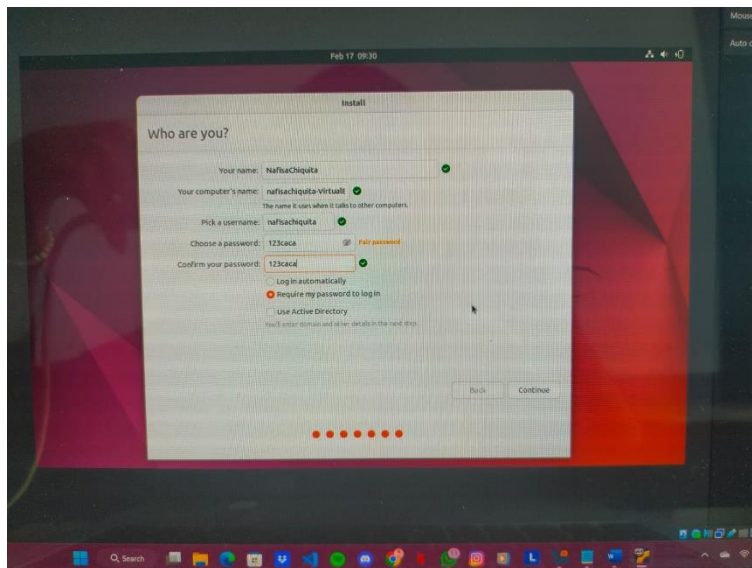
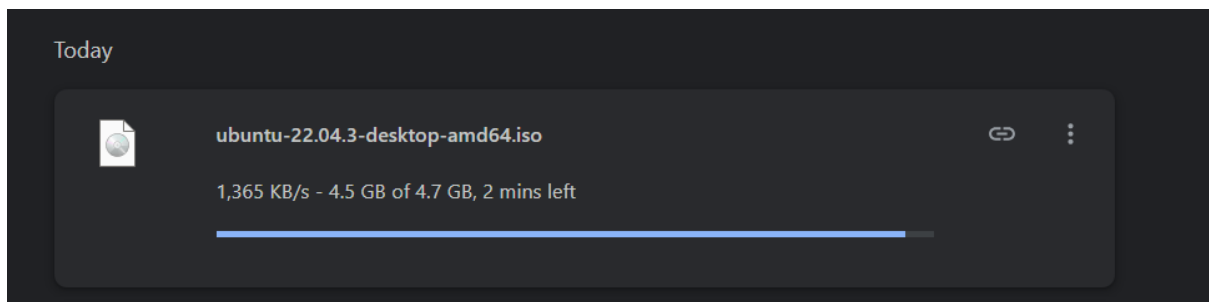


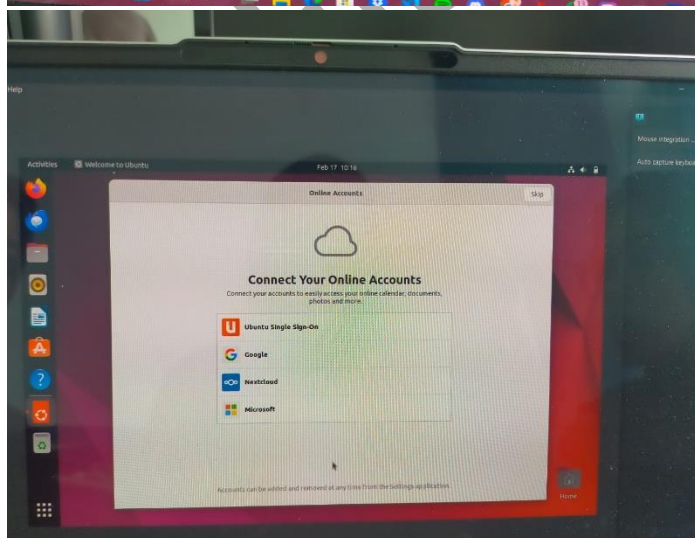
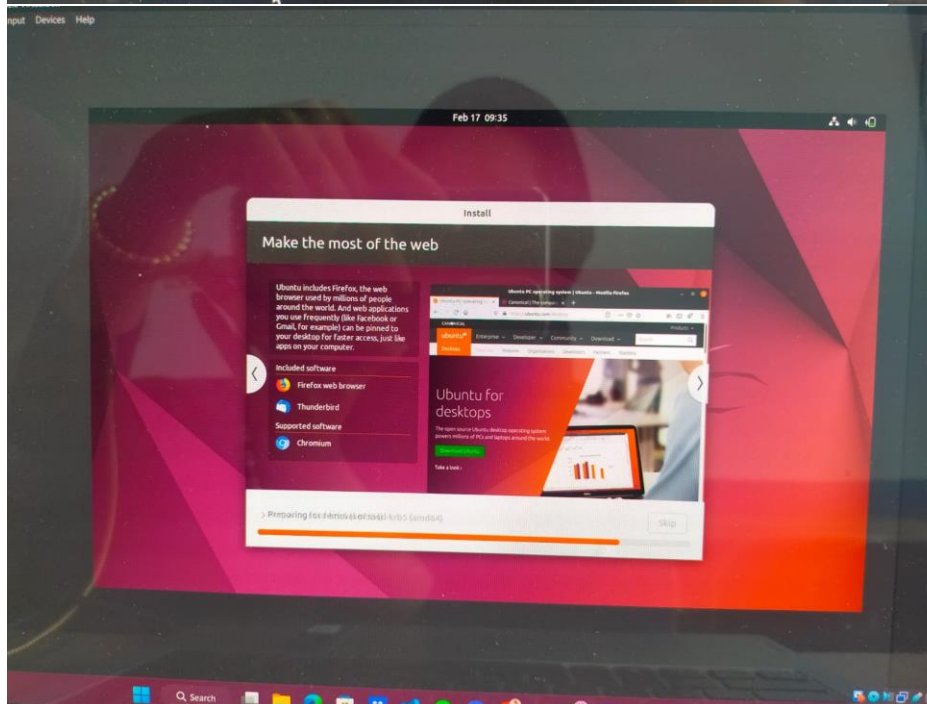
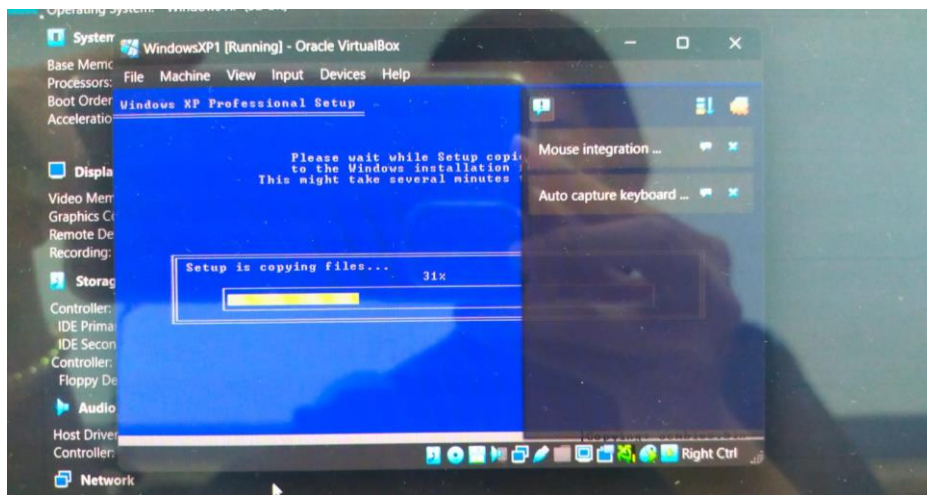


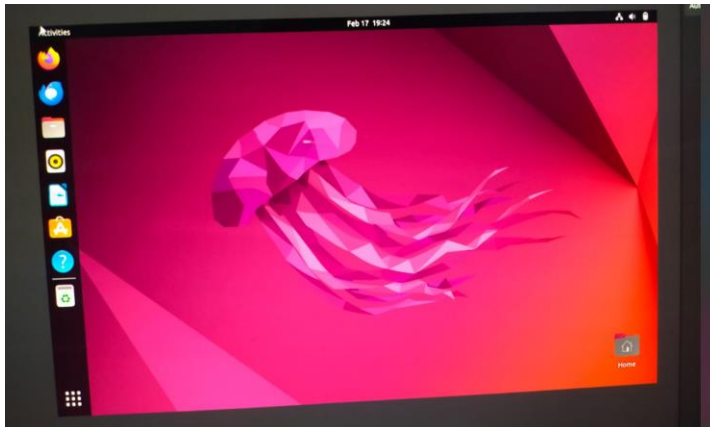




For linux :







## **2. Analyze the exercises that have been done.**

- Understanding VMware's virtualization process
- Hands-on practice with installing multiple OS types.
- Identifying compatibility issues and troubleshooting installation problems.
- Configuring system resources for optimal performance

## **3. Provide conclusions from this practicum.**

This practicum provides essential experience in virtualization, helping users set up Windows and Linux environments in VMware. It enhances knowledge of OS installations, system configuration, and troubleshooting. Mastering VMware is valuable for IT professionals managing virtual machines for development, testing, and production use.