[2CEIT603: CLOUD COMPUTING]

Practical: 3

AIM- Installation and Configuration of Hosted Based Hypervisor (VMware / Oraclevirtual BOX).

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Department of Computer Engineering

Practical: 3

What is Hypervisor?

A hypervisor is a form of virtualization software used in Cloud hosting to divide and allocate the resources on various pieces of hardware. The program which provides partitioning, isolation, or abstraction is called a virtualization hypervisor. The hypervisor is a hardware virtualization technique that allows multiple guest operating systems (OS) to run on a single host system at the same time. A hypervisor is sometimes also called a virtual machine manager(VMM).

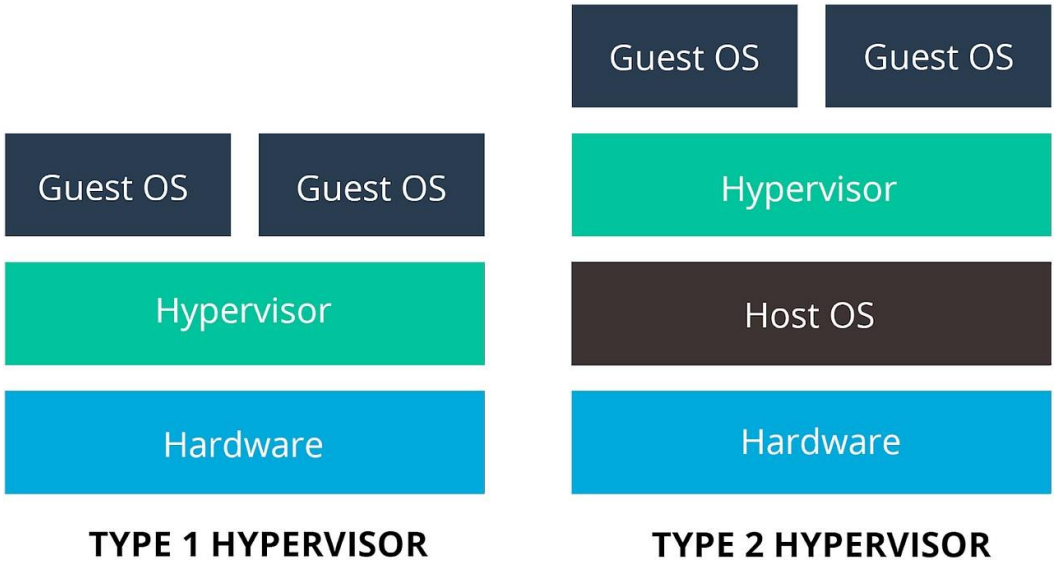


Figure 3.1: Types of Hypervisor

TYPE-1 Hypervisor:

The hypervisor runs directly on the underlying host system. It is also known as a "Native Hypervisor" or "Bare metal hypervisor". It does not require any base server operating system. It has direct access to hardware resources. Examples of Type 1 hypervisors include VMware ESXi, Citrix XenServer, and Microsoft Hyper-V hypervisor.

Pros & Cons of Type-1 Hypervisor:

Pros: Such kinds of hypervisors are very efficient because they have direct access to the physical hardware resources(like Cpu, Memory, Network, and Physical storage). This causes the empowerment of the security because there is nothing any kind of the third party resource so that attacker couldn't compromise with anything.

Cons: One problem with Type-1 hypervisors is that they usually need a dedicated separate machine to perform their operation and to instruct different VMs and control the host hardware resources.

TYPE-2 Hypervisor:

Practical: 3

A Host operating system runs on the underlying host system. It is also known as 'Hosted Hypervisor". Such kind of hypervisors doesn't run directly over the underlying hardware rather they run as an application in a Host system(physical machine). Basically, the software is installed on an operating system. Hypervisor asks the operating system to make hardware calls. An example of a Type 2 hypervisor includes VMware Player or Parallels Desktop. Hosted hypervisors are often found on endpoints like PCs. The type-2 hypervisor is very useful for engineers, and security analysts (for checking malware, or malicious source code and newly developed applications).

Pros & Cons of Type-2 Hypervisor:

Pros: Such kind of hypervisors allows quick and easy access to a guest Operating System alongside the host machine running. These hypervisors usually come with additional useful features for guest machines. Such tools enhance the coordination between the host machine and the guest machine.

Cons: Here there is no direct access to the physical hardware resources so the efficiency of these hypervisors lags in performance as compared to the type-1 hypervisors, and potential security risks are also there an attacker can compromise the security weakness if there is access to the host operating system so he can also access the guest operating system**.**

What is VirtualBox?

Oracle VM VirtualBox is a cross-platform virtualization application developed by the Oracle Corporation. It allows users to install operating systems on virtual hard disks such as Windows, macOS, Solaris and Linux.

As an example, you can run Windows and Linux on your Mac, run Windows server on your Linux server, or run Linux on your Windows PC while running your other existing applications.

Disk space and memory are the only problems that you'll face when installing multiple virtual machines.

Why You'll Need It

- Oracle's Virtual Box is easy to install and use
- It's free
- You can run and experience any operating system safely
- If you're a developer, Virtual Box can be used as a tool for safely testing your own development projects in multiple OS environments
- It can run everywhere from small embedded systems to laptops
- It's good for testing and disaster recovery as it can be easily copied, backed-up, and transported between hosts

VirtualBox Installation

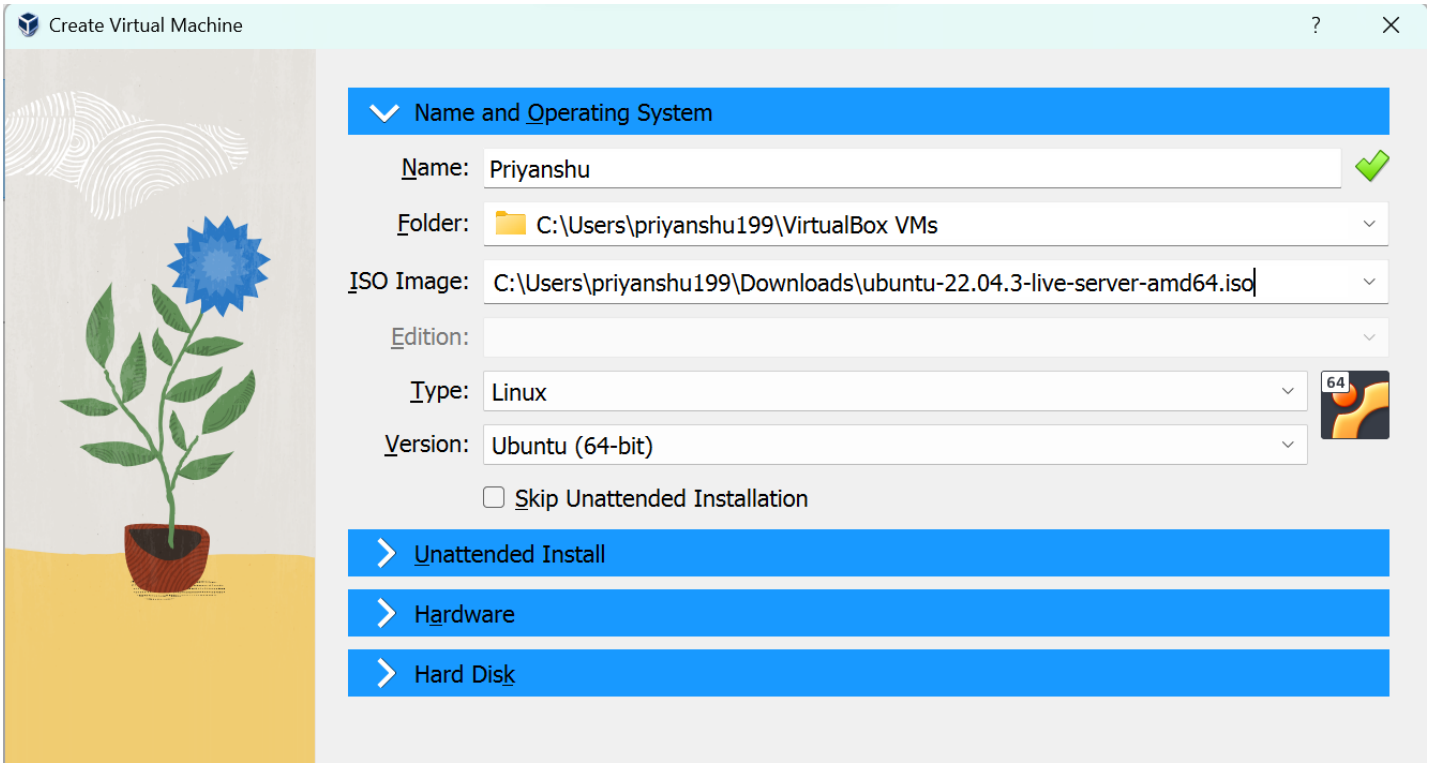
Practical: 3

VirtualBox can be downloaded here: VirtualBox Downloads **Why Ubuntu?**

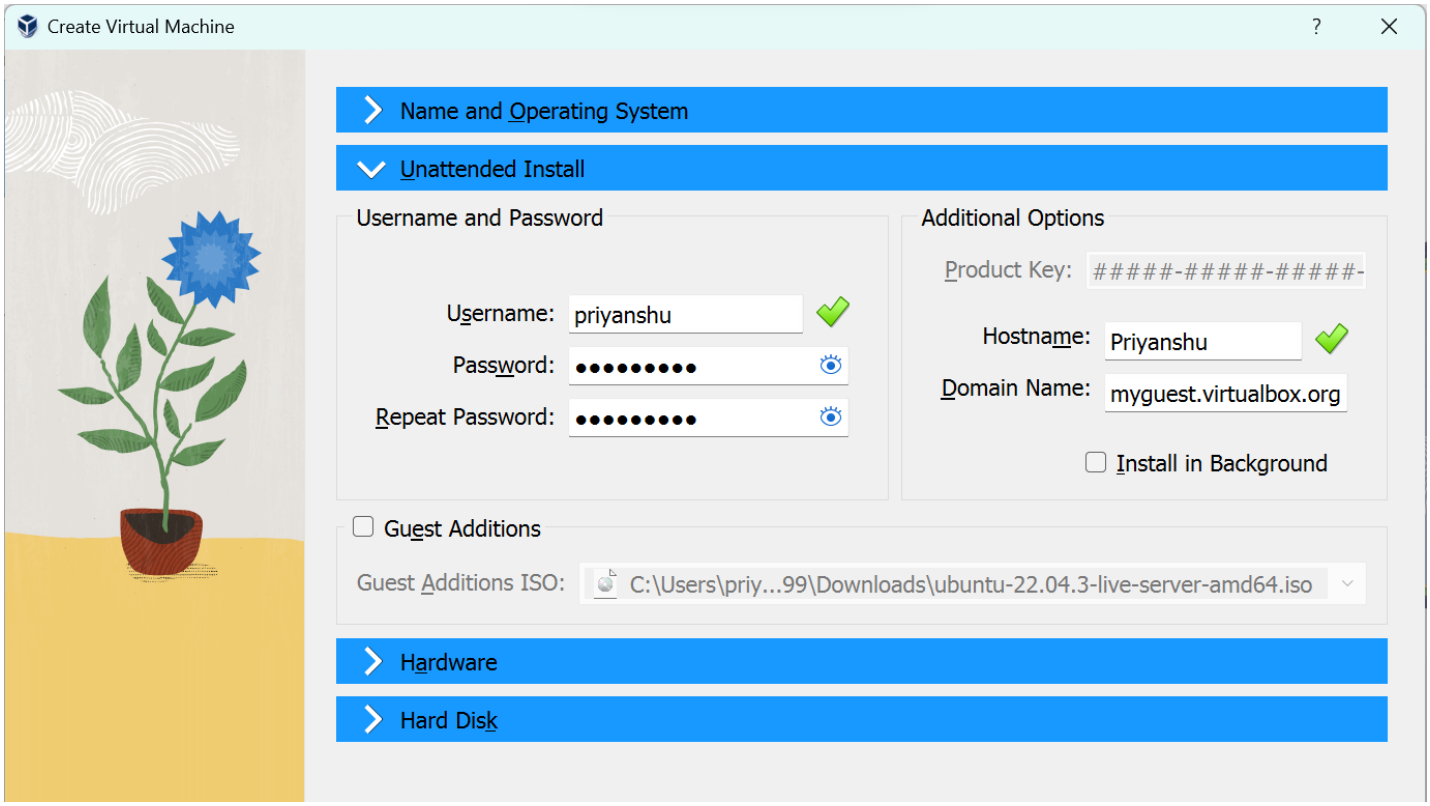
- It's free
- Easy customization: The GNOME desktop environment helps you customize easily • It's secure
- Ubuntu is open-source
- Friendly and supportive community
- Low system requirements
- According to FOSSBYTES, Ubuntu is the second best Linux distro for programming and developers [2019 Edition]
- It's beginner friendly

Setup for Ubuntu First, open VirtualBox, then click "New" to create a virtual machine.

Now select the ISO image of the OS you want to install.



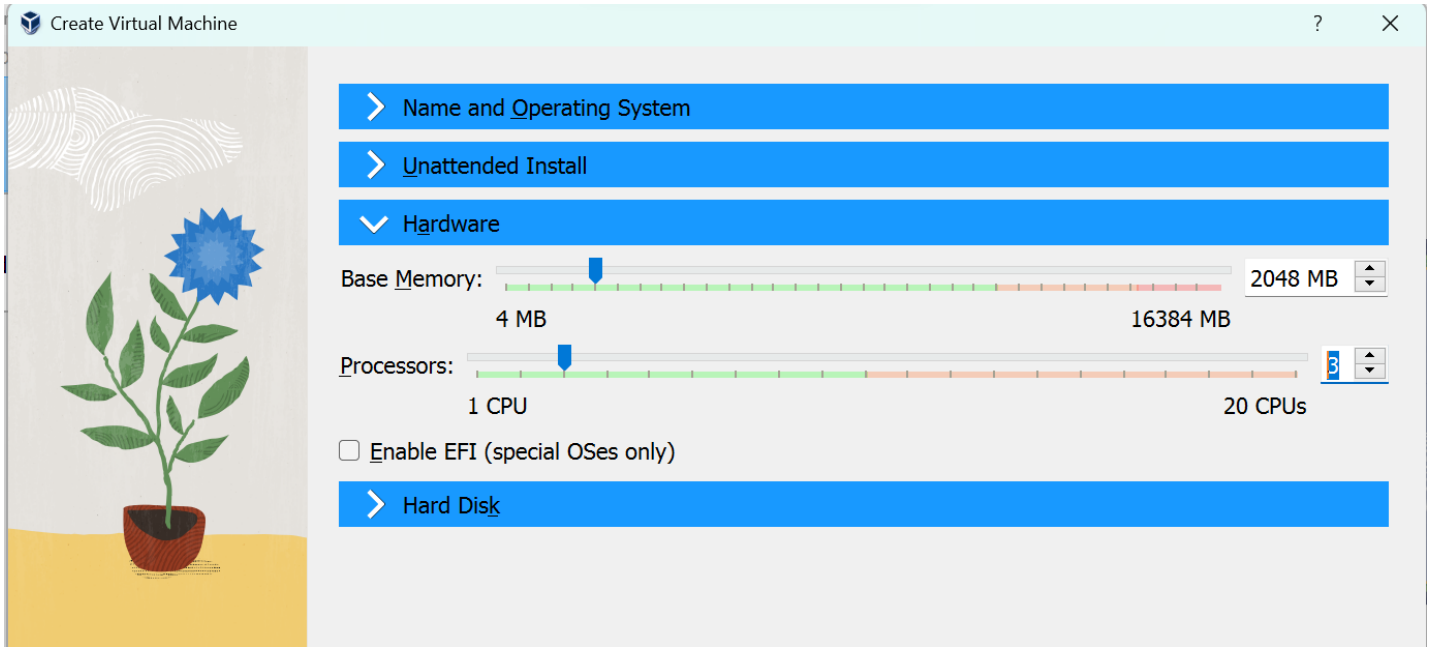
Now change the username and password as per your requirement



Now select the hardware option and set the hardware configuration as per the requirement youneed.

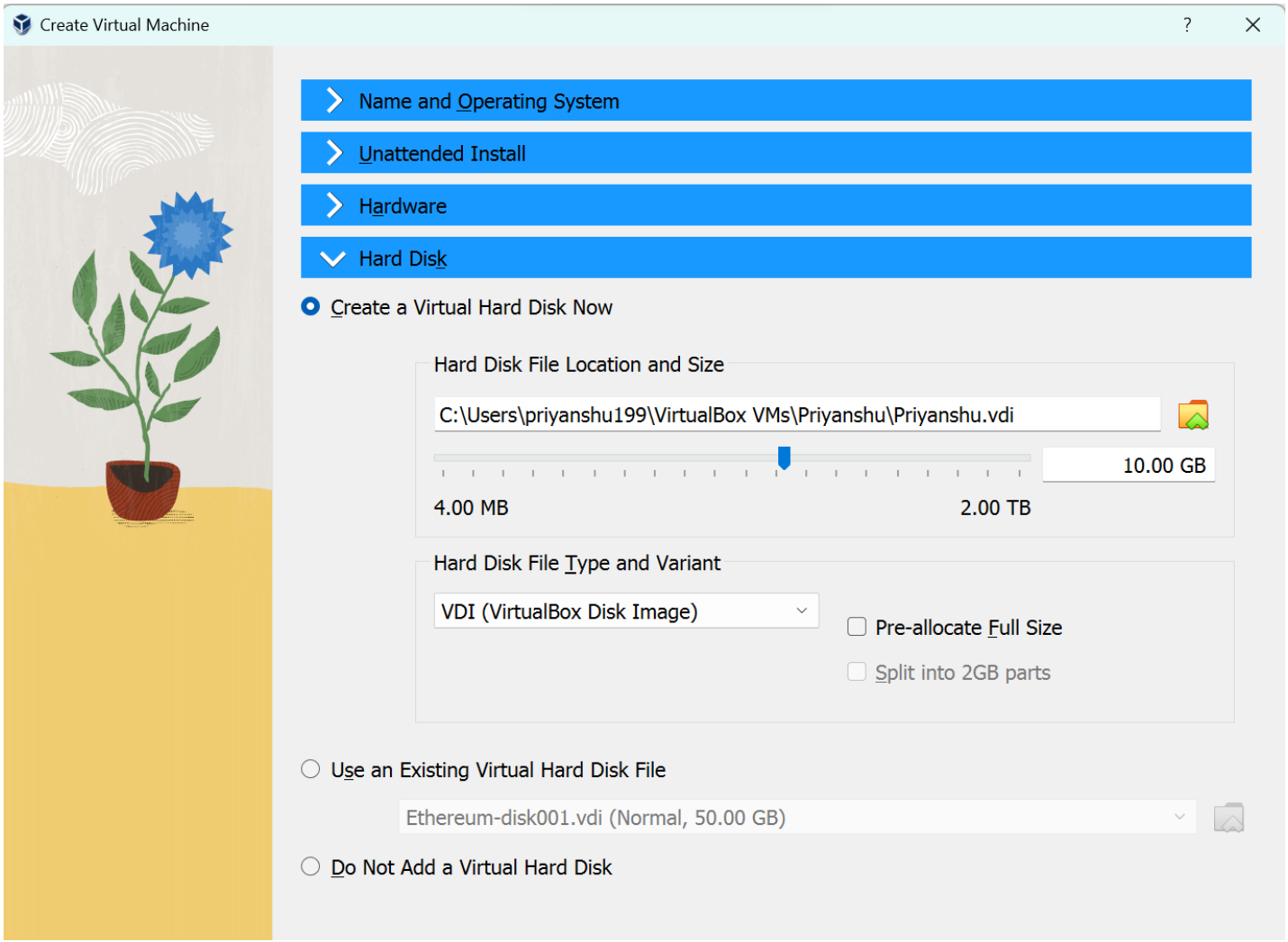
NOTE: Select any amount of memory you wish, but don't add more than 50 percent of your totalRAM.

As per my requirement I am selecting 4GB of RAM and selecting 3 CPUs from the available 8 CPUs.



Now we will select and create a Virtual Hard Disk. Select the size of the Virtual Hard Disk asper the requirement.

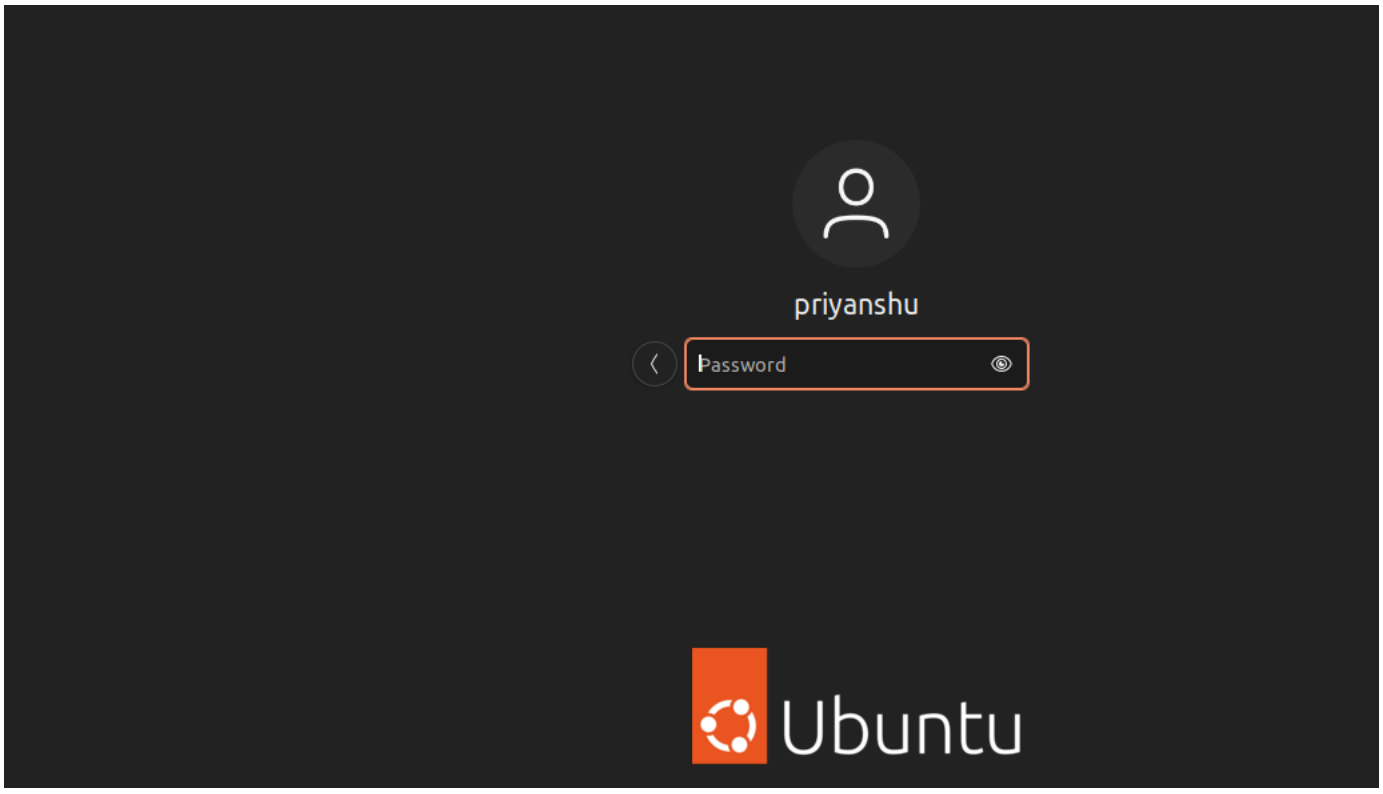
Now click “Finish” to complete the setup and launch the instance of the Ubuntu.



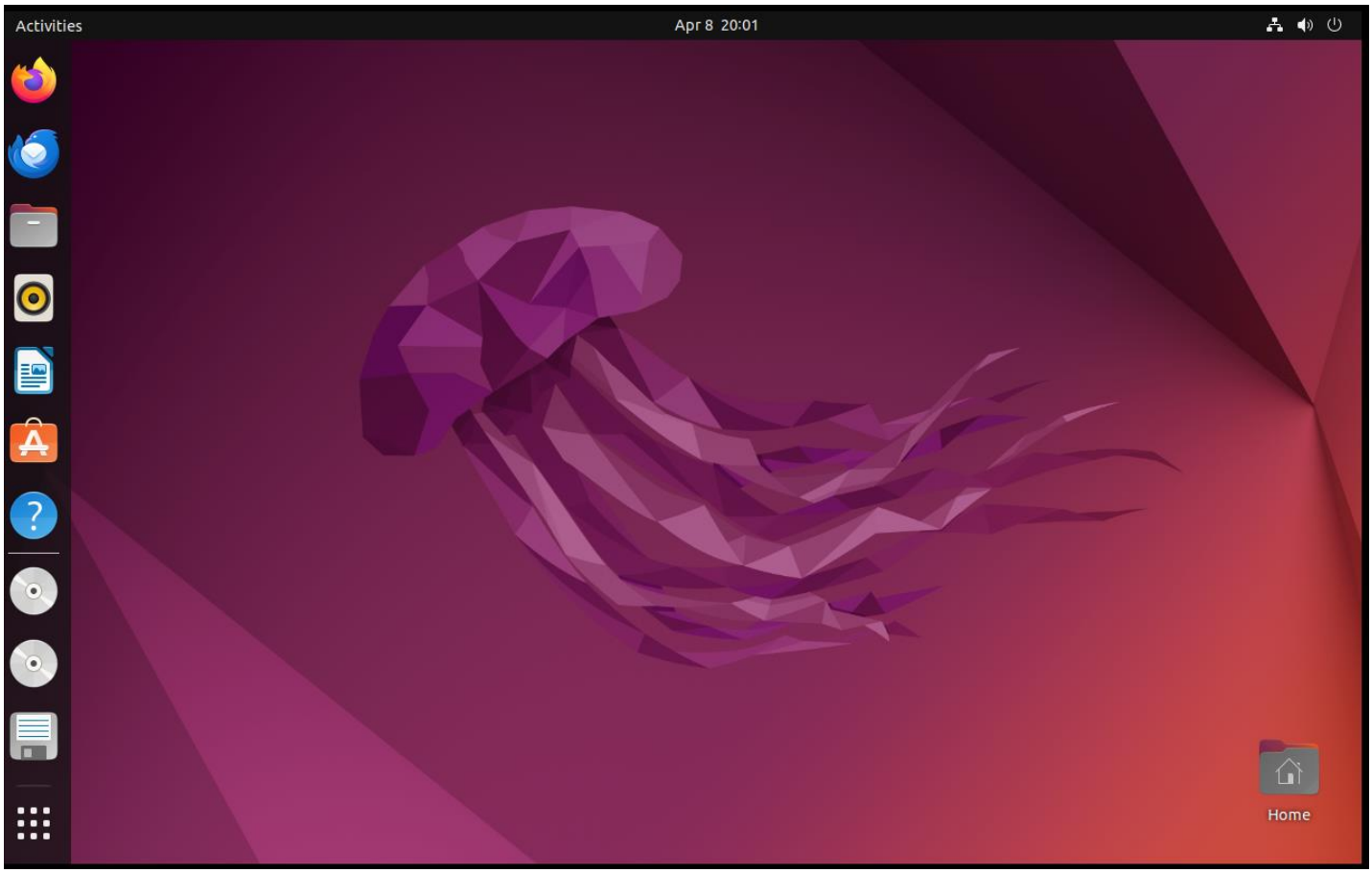
Now click “Finish” to complete the setup and launch the instance of the Ubuntu.

Practical: 3

Enter the credentials which you want to be used to access the Virtual Machine



After the successful installation of the Virtual Machine, the machine will reboot and start again.



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We have successfully installed Ubuntu in VirtualBox. It's ready to use for your future development projects.

Let's verify the installation. Open your terminal (Press Ctrl+Alt+T) and type in the commands below and check if they work.

1. pwd: This will print the current working directory
2. ls: This will list all items in your current directory

```
priyanshu@priyanshu-virtual-machine:~$ pwd
/home/priyanshu
priyanshu@priyanshu-virtual-machine:~$ powerof
```

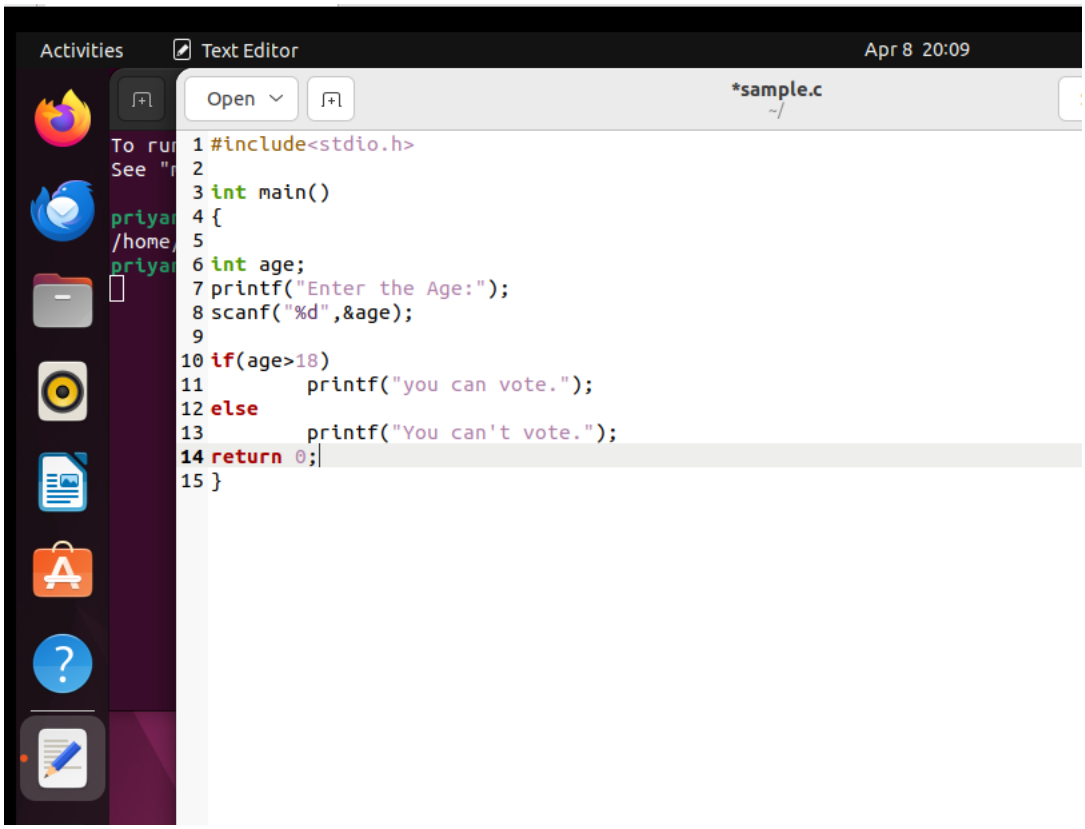
After checking those, power off your machine by using the following command.

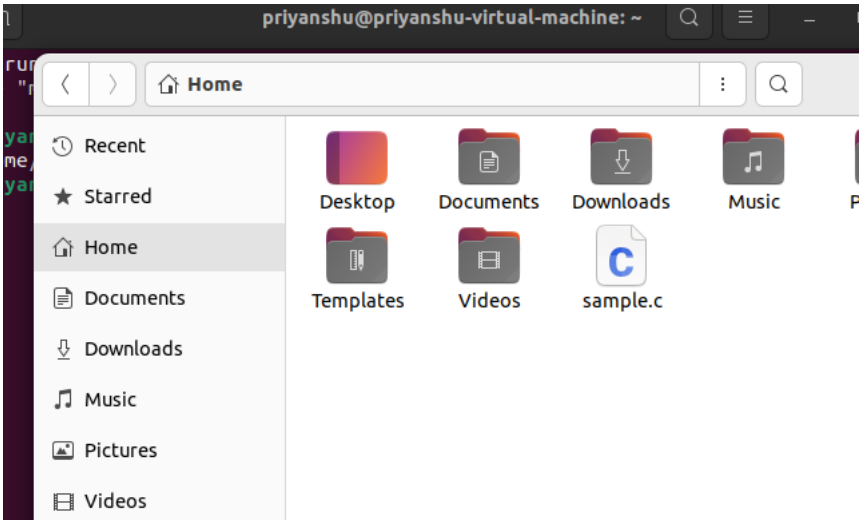
Practical: 3

Sample Program tested in Ubuntu:

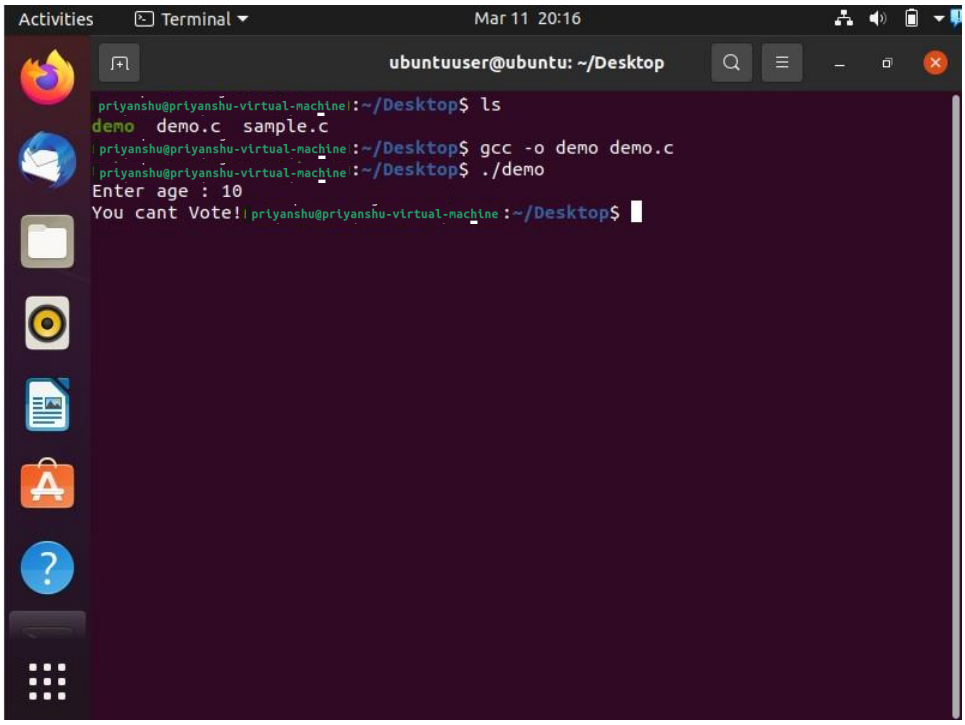
Creating a empty file using following command in the terminal “gedit Sample.c”Now writing a sample program in the file

```
priyanshu@priyanshu-virtual-machine:~$ gedit sample.c
```





Practical: 3



Conclusion

VirtualBox is free and is a great tool for running multiple operating systems on a single OS. Ubuntu has many benefits. If you're a beginner to Linux, I would recommend you use Ubuntu asit's beginner friendly.