

EXPERIMENT 1

AIM:-

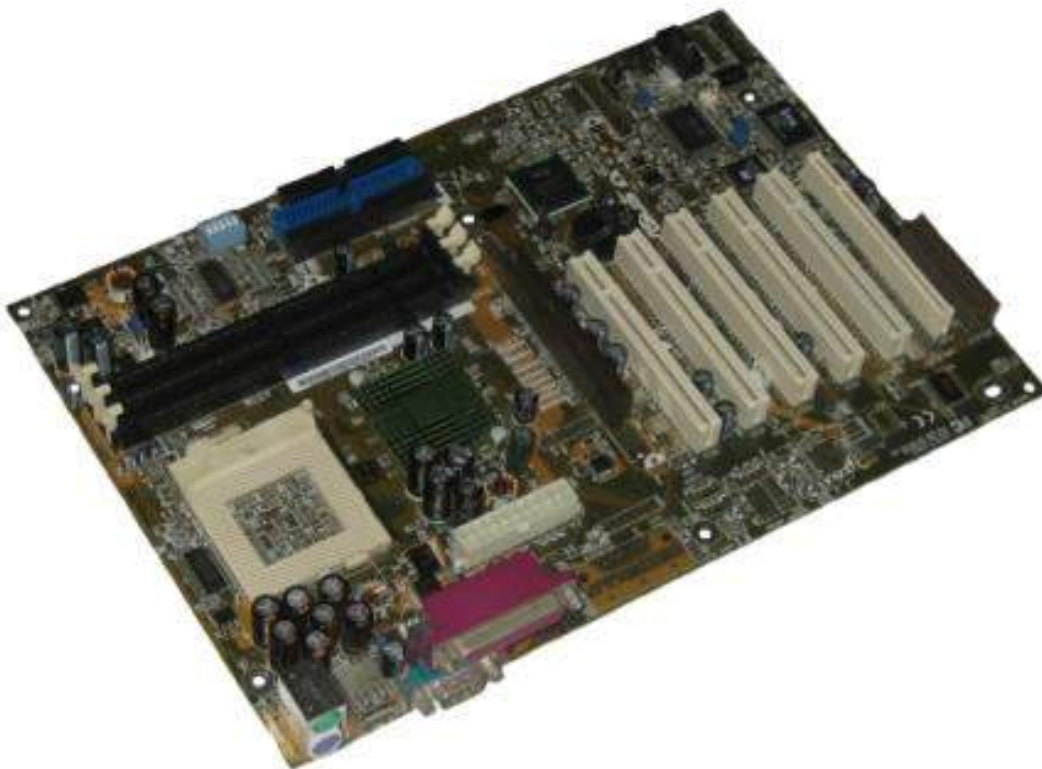
Introduction to computer hardware, physical identification of major components of a computer system such as motherboard, RAM modules, daughter cards, bus slots, SMPS, internal storage devices, interfacing ports.

ANSWER:-

Computer Hardware is the physical part of a computer, as distinguished from the [computer software](#) that executes or runs on the hardware. The hardware of a computer is infrequently changed, while software and data are modified frequently. The term soft refers to readily created, modified, or erased. These are unlike the physical components within the computer which are hard.

i.MOTHERBOARD

The motherboard is the body or mainframe of the computer, through which all other components [interface](#). It is the central circuit board making up a complex electronic system. A motherboard provides the electrical connections by which the other components of the system communicate. The mother board includes many components such as: central processing unit (CPU), random access memory (RAM), firmware, and internal and external buses.



ii.RANDOM ACCESS MEMORY(RAM)

Random access memory (RAM) is fast-access memory that is cleared when the computer is power-down. RAM attaches directly to the motherboard, and is used to store programs that are currently running. RAM is a set of integrated circuits that allow the stored data to be accessed in any order (why it is called random).

There are many different types of RAM. Distinctions between these different types include: writable vs. read-only, static vs. dynamic, volatile vs. non-volatile, etc.



iii.DAUGHTER CARDS

The daughter board is a computer hardware. It is also known as the piggyback board, riser card, daughter board, daughtercard or daughter card. A daughter board is a printed circuit board which is connected to the motherboard or expansion card. As compared to the motherboard, it is smaller in size. A daughter board does not act as an expansion card. An expansion card adds extra new functions to the computer. But a daughter board that is connected to the motherboard adds or supports the main functions of the motherboard.

Daughter boards are directly connected to the motherboards. You know that expansion cards are connected to the motherboard by using the bus and other serial interfaces. But daughter board is directly connected to the board by soldering. As an update of the motherboard or expansion card, daughter boards are released to extend the features and services of the motherboard or expansion cards.



iv.BUS SLOTS

Alternatively known as a expansion port, an expansion slot is a connection or port inside a computer on the motherboard or riser card. It provides an installation point for a hardware expansion card to be connected. For example, if you wanted to install a new video card in the computer, you'd purchase a video 5 expansion card and install that card into the compatible expansion slot.

An expansion slot is a socket on the motherboard that is used to insert an expansion card (or circuit board), which provides additional features to a computer such as video, sound, advanced graphics, Ethernet or memory.

The expansion card has an edge connector that fits precisely into the expansion slot as well as a row of contacts that is designed to establish an electrical connection between the motherboard and the electronics on the card, which are mostly integrated circuits. Depending on the form factor of the case and motherboard, a computer system generally can have anywhere from one to seven expansion slots. With a backplane system, up to 19 expansion cards can be installed.

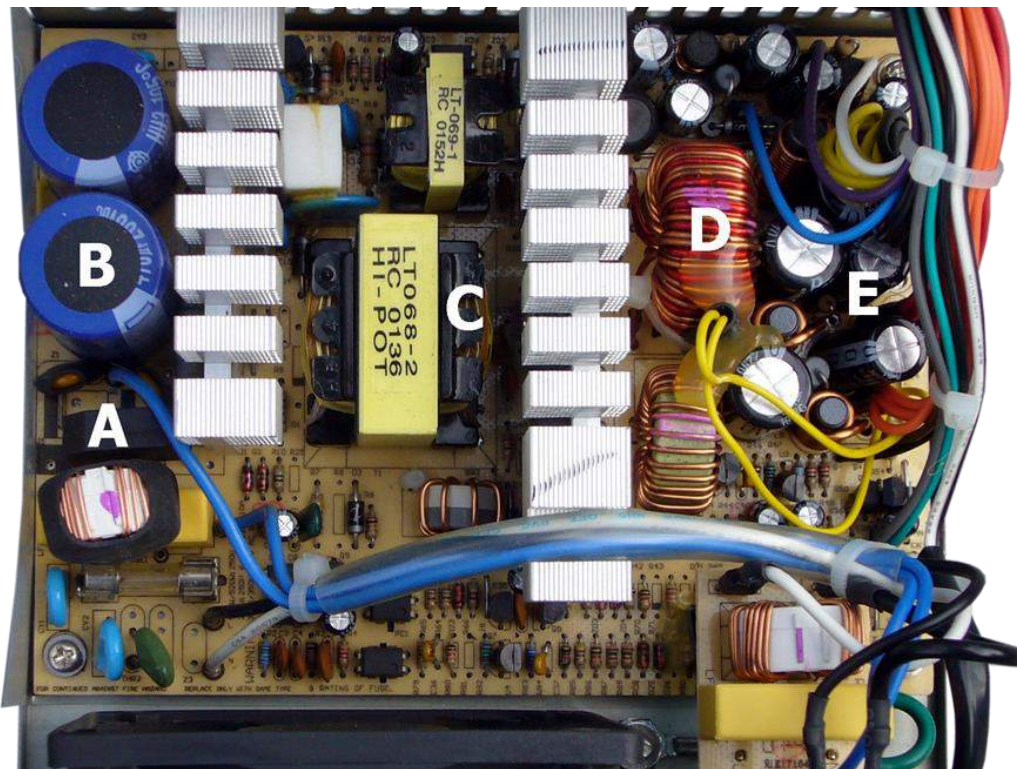


v.SMPS

A switched-mode power supply (SMPS) is an electronic circuit that converts power using switching devices that are turned on and off at high frequencies, and storage components such as inductors or capacitors to supply power when the switching device is in its non-conduction state.

Switching power supplies have high efficiency and are widely used in a variety of electronic equipment, including computers and other sensitive equipment requiring stable and efficient power supply.

A switched-mode power supply is also known as a switch-mode power supply or switching-mode power supply.

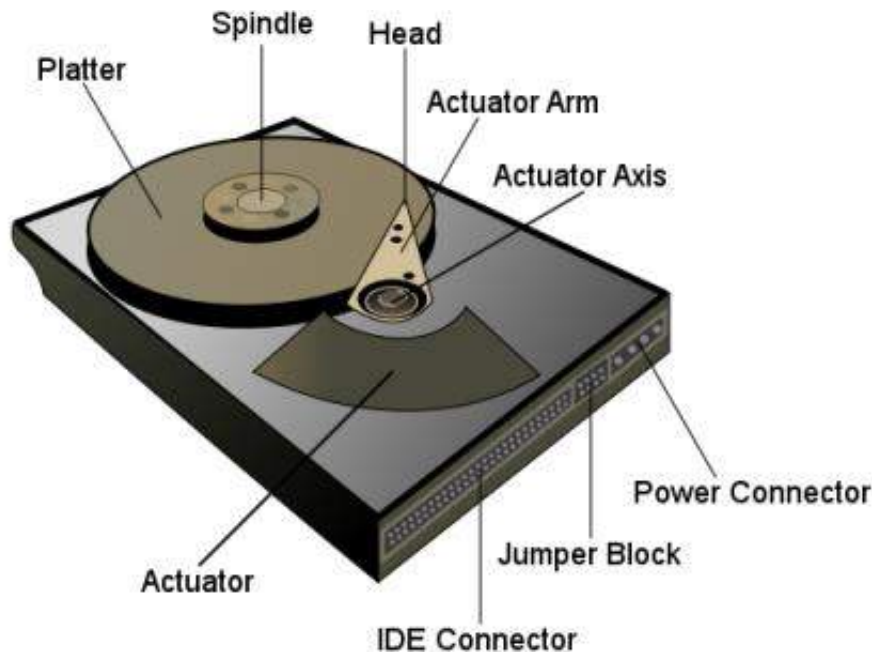


vi.INTERNAL STORAGE

Internal storage is hardware that keeps data inside the computer for later use and remains persistent even when the computer has no power. There are a few different types of internal storage. Hard disks are the most popular type of internal storage. Solid-state drives have grown in popularity slowly. A disk array controller is popular when you need more storage than a single hard disk can hold.

i.Hard Disk Drive

A hard disk drive (HDD) is a non-volatile storage device which stores digitally encoded data on rapidly rotating platters with magnetic surfaces. Just about every new computer comes with a hard disk these days unless it comes with a new solid-state drive. Typical desktop hard disk drives store between 120 and 400GB, rotate at 7,200 rpm, and have a media transfer rate of 1 Gbit/s or higher. Hard disk drives are accessed over one of a number of bus types, including parallel ATA(also called IDE), Serial ATA (SATA), SCSI, Serial Attached SCSI, and Fibre Channel.



ii.Solid-State Drive

A solid-state drive (SSD) is a data storage device that uses solid-state memory to store persistent data. An SSD emulates a hard disk drive, thus easily replacing it in any application. SSDs have begun to appear in laptops because they can be smaller than HDDs. SSDs are currently more expensive per unit of capacity than HDDs which is why they have not caught on so quickly.

iii.Disk Array Controller

A disk array controller is a device which manage the physical disk drives and presents them to the computer as logical units. It almost always implements hardware RAID. RAID (Redundant Array of Independent Drives) is a technology that employs the simultaneous use of two or more hard disk drives to achieve greater levels of performance, reliability, and/or larger data volume sizes. A disk array controller also provides additional disk cache.

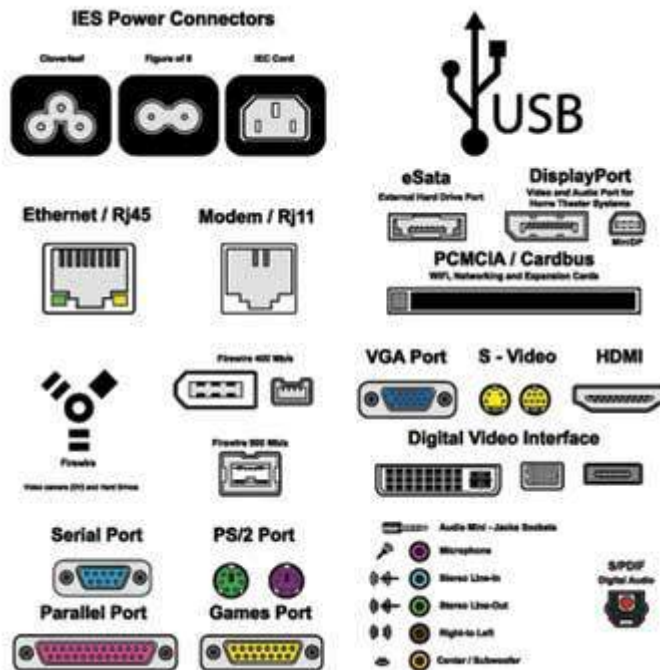
vii.INTERFACING PORTS

A port is a physical docking point using which an external device can be connected to the computer. It can also be programmatic docking point through which information flows from a program to the computer or over the Internet.

A port has the following characteristics –

- External devices are connected to a computer using cables and ports.

- Ports are slots on the motherboard into which a cable of external device is plugged in.
- Examples of external devices attached via ports are the mouse, keyboard, monitor, microphone, speakers, etc.



Let us now discuss a few important types of ports –

Serial Port

- Used for external modems and older computer mouse
- Two versions: 9 pin, 25 pin model
- Data travels at 115 kilobits per second

Parallel Port

- Used for scanners and printers
- Also called printer port
- 25 pin model

- IEEE 1284-compliant Centronics port

PS/2 Port

- Used for old computer keyboard and mouse
- Also called mouse port
- Most of the old computers provide two PS/2 port, each for the mouse and keyboard
- IEEE 1284-compliant Centronics port

Universal Serial Bus (or USB) Port

- It can connect all kinds of external USB devices such as external hard disk, printer, scanner, mouse, keyboard, etc.
- It was introduced in 1997.
- Most of the computers provide two USB ports as minimum.
- Data travels at 12 megabits per seconds.
- USB compliant devices can get power from a USB port.

VGA Port

- Connects monitor to a computer's video card.
- It has 15 holes.
- Similar to the serial port connector. However, serial port connector has pins, VGA port has holes.

Power Connector

- Three-pronged plug.
- Connects to the computer's power cable that plugs into a power bar or wall socket.

Firewire Port

- Transfers large amount of data at very fast speed.
- Connects camcorders and video equipment to the computer.
- Data travels at 400 to 800 megabits per seconds.
- Invented by Apple.
- It has three variants: 4-Pin FireWire 400 connector, 6-Pin FireWire 400 connector, and 9-Pin FireWire 800 connector.

Modem Port

- Connects a PC's modem to the telephone network.

Ethernet Port

- Connects to a network and high speed Internet.
- Connects the network cable to a computer.
- This port resides on an Ethernet Card.
- Data travels at 10 megabits to 1000 megabits per seconds depending upon the network bandwidth.

Game Port

- Connect a joystick to a PC
- Now replaced by USB

Digital Video Interface, DVI port

- Connects Flat panel LCD monitor to the computer's high-end video graphic cards.
- Very popular among video card manufacturers.

Sockets

- Sockets connect the microphone and speakers to the sound card of the computer.

EXPERIMENT3

Write about System Specification and Server?

System Specification

System specifications help to define the operational and performance guidelines for a system. System requirements can be broadly classified as functional requirements, data requirements, quality requirements and constraints. They are often provided to consumers in complete detail. System requirements often indicate the minimum and the recommended configuration. The former is the most basic requirement, enough for a product to install or run, but performance is not guaranteed to be optimal. The latter ensures a smooth operation.

Hardware system requirements often specify the operating system version, processor type, memory size, available disk space and additional peripherals, if any, needed. Software system requirements, in addition to the aforementioned requirements, may also specify additional software dependencies (e.g., libraries, driver version, framework version). Some hardware/software manufacturers provide an upgrade assistant program that users can download and run to determine whether their system meets a product's requirements.



A dark blue rectangular graphic with a light blue border. At the top center is a light blue monitor icon. To its right, the text "PC SPECS" is written in light blue. Below this, a list of PC components is displayed in white text, with each component name in light blue. The components are: CPU : Intel i9-9990XE, GPU : 2x MSI RTX 2080Ti SEA HAWK X, RAM : 8x 16GB GSKILL Trident Z RGB, MOBO : ASUS ROG Rampage VI, PSU : Corsair AX1200I 80+ Platinum, Storage : 2x WD Black SN750 2TB NVMe. A horizontal light blue line separates this section from the next. The second section lists peripherals in white text, with each peripheral name in light blue: Monitors : 3x Asus ROG PG279Q 1440p 165Hz, Mouse : Logitech G Pro Wireless, Keyboard : Ducky One 2 Mini, Headphones : Audio-Technica ATH-M50X, Microphone : Audio-Technica AT2020. At the bottom left is a light blue logo consisting of a stylized 'C' and 'P' inside a hexagon. To its right, the text "Powered by CyberPowerPC" is in light blue, and "For more information, click HERE!" is in white. At the bottom right is a light blue cat-like mascot icon.

 **PC SPECS**

CPU : Intel i9-9990XE
GPU : 2x MSI RTX 2080Ti SEA HAWK X
RAM : 8x 16GB GSKILL Trident Z RGB
MOBO : ASUS ROG Rampage VI
PSU : Corsair AX1200I 80+ Platinum
Storage : 2x WD Black SN750 2TB NVMe

Monitors : 3x Asus ROG PG279Q 1440p 165Hz
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Headphones : Audio-Technica ATH-M50X
Microphone : Audio-Technica AT2020

 **Powered by CyberPowerPC**
For more information, click [HERE!](#) 

What affects a computers performance?

Overall, the performance of a computer is dependant on how well it works together as a whole. Continually upgrading one part of the computer while leaving outdated parts installed will not improve performance much, if at all. Below, we discuss some of the most important parts of the computer regarding it's speed and computing power. The description of these parts is by no means complete and only serves to give newer users some understanding of what various computer specifications mean. It should also be noted that this web page was last updated January 2003, but the same factors can still be applied in 2006. The processor, memory and videocard are the most important components when determining performance inside a computer. Any specifics about pieces of hardware will be outdated in about six months or so. Gaining an understanding of what each specification means, and what each part does, is the goal of this section.

Reference Chart

Bit (b)	Smallest unit of storage possible. 1 or 0.
Byte (B)	8 bits
KiloByte (KB)	1000* Bytes
MegaByte (MB)	1000 KB
GigaByte (GB)	1000 MB

* Commonly approximated as 1000 for convenience. Actual value is 1024.

1.Processor speed (MHZ, L1 L2 cache, x86 and other chip types)

Average PC Desktop (1.5 - 2.5 Ghz)

Average Laptop or Macintosh (1.0 Ghz)



Clock speed, a.k.a. Processor speed is often played up to be the major factor in a computer's overall performance. In rare cases this is true, but an average user rarely uses 100 percent of his Central Processing Unit's power. (CPU). Things like encoding video or encrypting files, or anything that computes large, complex, numbers requires a lot of processor power. Most

users spend most of their time typing, reading email or viewing web pages. During this time, the computer's CPU is probably hovering around 1 or 2 percent of it's total speed. Startup time is probably the only time the CPU is under stress, and even then it's often limited due to the hard drive speed.

Megahertz (MHZ) or Gigahertz (GHZ or 1000MHZ) is the number of times the CPU can switch back and forth from 1 to 0. It is the driving force in the power the processor has (all other things being equal). Higher MHZ chips use more power and produce more heat.

Level 1 (L1) and Level 2(L2) cache is usually onchip RAM that is extremely fast. SRAM is different than System RAM and only used on processors. It stores data right before and after it is processed. SRAM is extremely expensive; most chips today only have 128 Kilobytes of L1 cache, and 256-512K of L2 cache. (This is what makes a Pentium 3 or 4 chip different than a celeron chip)

x86 is the architecture type of all Windows based computers. All processors sold today for computers running the Windows OS (operating system) are 32 bit, meaning they process 32 bits of information each clock cycle (a 1GHZ chip does 1 billion clock cycles per second). Not all CPU's are x86. For example Apple computers use Motorola's chip design called PowerPC, which comes in both 64 and 128 bit flavors. This is one reason apple computers can outperform high-end PC's, despite their lower processor speeds. Currently Intel and AMD are developing 64 bit x86 chips. The disadvantage of higher bit architecture is that one needs to make changes to any software that one may want to work with on the new design; this is one reason Mac software will not run without specialized software on PC's, and visa-versa.

2.System RAM speed and size (MHZ and Megabytes)

Average Desktop - 256 megabytes

Average Laptop - 128 megabytes



The amount and speed of the RAM in your computer makes a huge difference in how your computer performs. If you are trying to run Windows XP with 64 MB of RAM it probably won't even work. When the computer uses up all available RAM it has to start using the hard drive to cache data, which is much slower. The constant transfer of data between RAM and virtual memory (hard drive memory) slows a computer down considerably. Especially when trying to load applications or files.

The two types differ in the technology they use to hold data, dynamic RAM being the more common type. Dynamic RAM needs to be refreshed thousands of times per second. Static RAM does not need to be refreshed, which makes it faster; but it is also more expensive than dynamic RAM. Both types of RAM are volatile, meaning that they lose their contents when the power is turned off. Also the speed of your RAM can be influential. The normal speed of RAM in most computers today is pc100 (100mhz). This runs fine for most applications. Gamers or high-end machines probably are using DDR (double data rate) RAM. It's newer and more expensive, but runs considerably faster (266mhz). Note that all computers cannot use DDR RAM.

3.Disk speed and size (RPM's and Gigabytes)

Average Desktop (40 Gigabytes)

Average Laptop (20 Gigabytes)



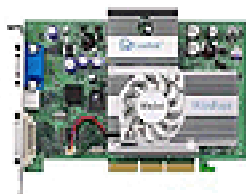
The biggest factor in your computer's performance is the hard disk speed. How fast the hard drive can find (average seek time), read, write, and transfer data will make a big difference in the way your computer performs. Most hard drives today spin at 7,200 RPMS, older models and laptops still spin at 5,200 RPMS, which is one reason laptops often appear sluggish to a desktop equivalent.

The size of your hard drive plays a very little role in the performance of a computer. As long as you have enough free space for virtual memory and keep the disk defragmented it will perform well no matter what the size.

4.Video card - (onboard video RAM, chip type and speed)

Average Desktop (32 - 64 Megabyte low end AGP card)

Average Laptop (16 Megabyte onboard chip)

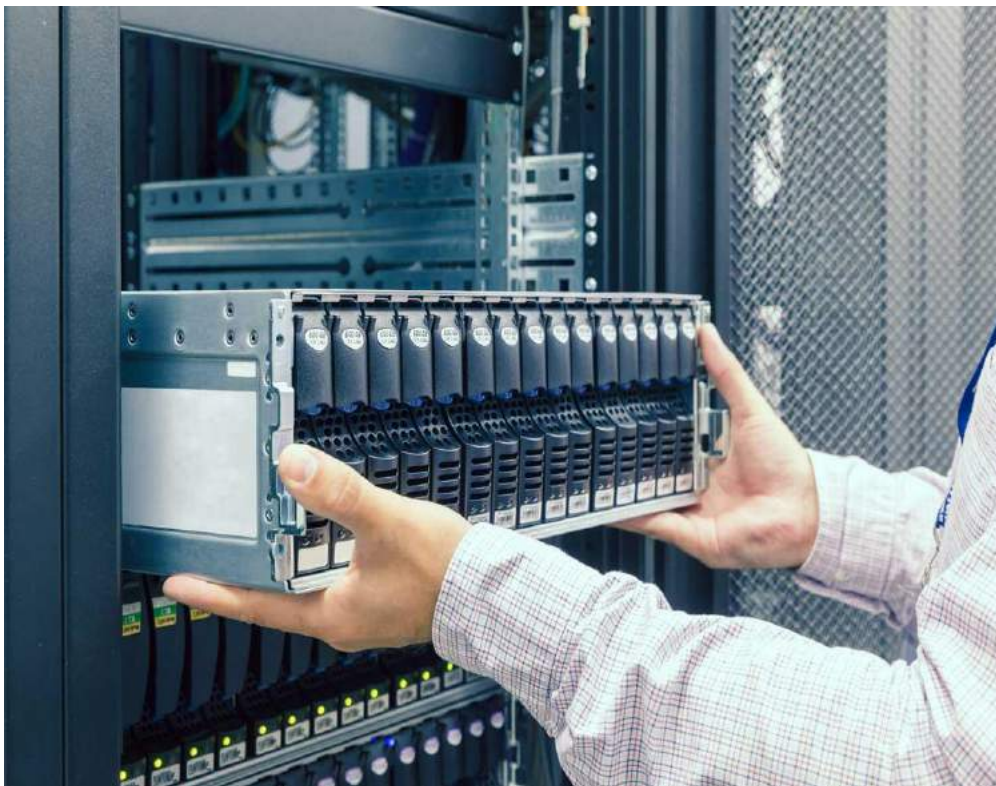


Whenever your computer puts an image on the screen something has to render it. If a computer is doing this with software it is often slow and will affect the performance of the rest of the computer. Also, the image will not be rendered as crisp or as smoothly in the case of video. Even a low-end video card will significantly improve the performance of the computer by taking the large task of rendering the images on the screen from the CPU to the graphics card. If you work with large image files, video or play games you will want a higher end video card. Video cards use their own RAM called Video RAM. The more Video RAM a computer has the more textures and images the card can remember at a time. High end graphics cards for desktops now come with up to 64 megabytes of Video RAM, Laptops often only have 8 or 16 megabytes of Video RAM.

SERVER

A server is a computer that serves information to other computers. These computers, called clients, can [connect to a server](#) through either a local area network or a wide area network, such as the internet. A server is a vital piece of [your IT infrastructure](#). A server collects and sends information across a network. That can be a local network, like your business network, or a wider network across multiple locations.

Any computer running the right software can be a server. Although when we hear the word server we think of enormous, high-powered machines that push and pull data across the web.

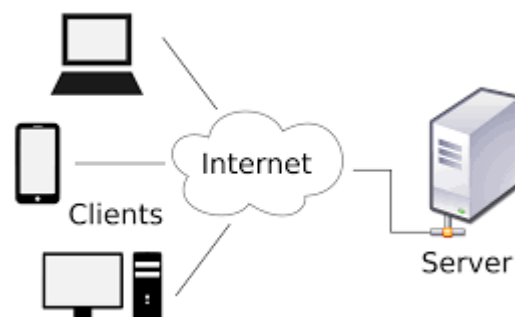


How does a server works?

Every time you use the internet you are accessing a server. When you enter a URL into a browser your computer communicates with the server hosting that website and pulls the data onto your machine.

This is a simplistic view of how the process works

- You enter a URL and your web browser requests a web page
- The web browser requests a full URL for the site it wants to display
- This information is sent to the server
- The web server finds and builds all the data needed to display the site (this is why some sites load quicker than others)
- Your web browser receives the data and displays the website to you



Types of servers

There are many types of servers, which are as follows:

- Webserver
- Application server
- Blade server
- Cloud server
- Database server
- Dedicated server

- Print server
- Proxy server
- File server
- Mail server
- Standalone server
- Domain name service

Web Server

A web server offers web pages or other content to the web browser by loading the information from a disc and transfer files by using a network to the user's **web browser**. It is used by a computer or collection of computers to provide content to several users over the internet. This exchange was done with the help of **HTTP** communicating between the browser and the server. There are some examples of web servers given below; you can also download these web servers from given below *download links*:

- Apache: <https://www.apache.org/>
- Tomcat: <https://tomcat.apache.org/>
- Nginx: <https://www.nginx.com/>
- Savant: <http://savant.sourceforge.net/>
- Boa: <http://www.boa.org/>
- FoxServ: <http://www.foxserv.net/>
- IIS: <https://www.iis.net/>
- Lighttpd: <https://www.lighttpd.net/>

Application server

It is an environment where applications are able to run, no matter which types of applications and what operation they perform. It is also known as a type of middleware and can be able to develop and run web-based applications. Generally, it is used to connect database servers and end-user. There are several types of application servers, as well as **.NET Framework**, **Java**, and **PHP** application servers.

Furthermore, it offers users various advantages, such as:

- It allows applications for a more centralized approach to updates and upgrades, which provides data and code integrity.
- It offers security with the help of the authenticating process and centralizing the management of data access.
- For heavy usage applications, it improves performance by limiting network traffic.

Blade server

It is a hardware component, also known as an expansion module, or a high-density server that can be installed into a chassis. It provides advanced functionality, such as allows an expansion card in a computer at a much bigger scale. For example, if more fiber lines are required, additional fiber blades can be added, as a switch or router with the blade server provides complete customization.



Dell PowerEdge 1855

Servers can be reduced to a single thin server by removing hard drives, ongoing miniaturization of computing parts, and eliminating internal cooling, which is known as the blade server. Additionally, it can be stored in racks in server rooms as the blade servers are smaller in size and can be replaced more easily. It can save space and make easy a network of hundreds of servers.

Cloud server

It is a virtual server instead of a physical server that runs in a cloud computing environment. It can be accessed by using remote as it is hosted, built, and delivered via cloud computing platform over the internet. It has similar functionality and capabilities to a traditional physical server but accessed through remotely from a cloud service provider. Today's there are different types of server providers, as well as **IBM** Cloud, Google's Cloud Platform, and Microsoft Azure.

Database server

It is a computer system that allows other systems to access and retrieve data from a database. These servers respond to several requests to the clients and run database applications. Databases can require extraordinary amounts of disk space and can be accessed by multiple clients at any given time. It is also used by many companies for storage purposes. It allows users to access the data with the help of running a query by using a query language specific to the database. For example, SQL is a structured query language, which allows executing a

query to access the data. The most common types of database server software include **DB2**, **Oracle**, Microsoft **SQL**, and Informix.

Dedicated server

A dedicated server is a single computer, which is hosted by a company and allows only one company to rent and access. It is dedicated to only one client and cannot be shared with any other clients. Some of the networks require one computer to be isolated for managing connections between all other devices. A dedicated server can be a part of a computer that has the capability to manage printer resources.

Remember that all servers cannot be a dedicated server. In some networks, it can be possible for a computer to work as a server and also able to perform other functionalities. The hosting company offers an add-on service for the client, like administration services to freeing the client from having to worry about the server. The hosting company also utilizes hard security plans for providing safeguard their clients' data.

Furthermore, the hosting company keeps all or most of the maintenance on the dedicated server. Such as:

- It maintains all update activities of the operating system and any installed applications.
- It monitors the server and applications and manages security by intrusion detection and prevention.
- It contains data backups, disaster recovery, and firewall maintenance.

Print server

The printer server manages one or more printers over the network. It is responsible for responding to print requests from several clients, rather than attaching a printer to every workstation. Nowadays, some higher-end and larger printers are available with their own built-in print server that eliminates the requirement for an additional computer-based server.

Proxy server

A computer server that acts as an intermediary between a client and a server known as a proxy server. It is a part of another computer or gateway server that isolates a local network from outside networks. It takes requests from the client and passes it to another server for processing. It receives the requested information from the second server. Then, it replies to the original client as if it is giving a reply own self.

A proxy server loads the page faster and reduces the network bandwidth as it caches all pages that accessed through the network. A page that is not in proxy server cache, it accesses this page via its own IP address. Thereafter, it caches that page and sends it to the user.

File server

It is a computer on a network that is used to store and distribute files. It allows multiple users or clients to share files, which is stored on a server. Furthermore, it can improve performance by maximizing readability and writing speeds.

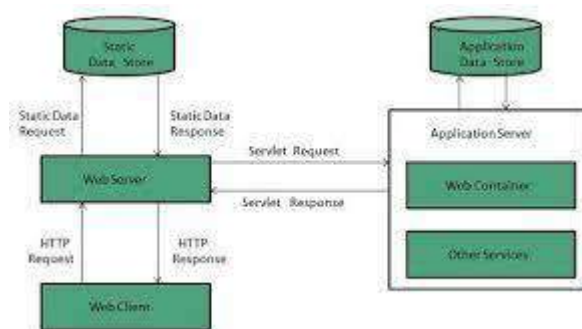
Mail server

A mail server is a central computer that stores electronic emails for clients over the network. It is much like the post office that obtains emails sent to the user and stores them until it is not requested by a user. It uses standard email protocols to send and receive an email like, **simple mail transfer protocol (SMTP)** handles outgoing mail requests and sends messages. The POP3 and IMAP protocols are used to process incoming mail and also receive messages. These protocols handle all the connections when users log on to a mail server by using email or webmail interface.

Sometimes, mail servers and web servers are merged in a single machine. However, Hotmail and Gmail (public mail services) and large ISPs (Internet service provides) may use dedicated hardware to send and receive an email. A mail server software must be installed on the computer, which gives permission to the administrator of the system to create and manage email accounts for any domains hosted on the server. For instance, if the domain name 'javatpoint.com' is hosted by the server, it has the ability to provide email accounts ending in 'javatpoint.com'.

Standalone server

A standalone server is a serial transmission replacement for the parallel SCSI, and it runs alone. It is an improvement of traditional SCSI and does not belong to a **Windows** domain. It supports a maximum of 128 synchronous devices at a transmission speed of 3 Gb in a second. It can also communicate with SATA and SCSI and includes two data ports. It offers local authentication and access control for any resource that is generated from a standalone server. Additionally, users only need to create user account other than it does not need any complex actions, as it does not offer network logon services.



EXPERIMENT 2:

INSTALLATION OF UBUNTU OPERATING SYSTEM USING VIRTUAL BOX

SOLUTION:

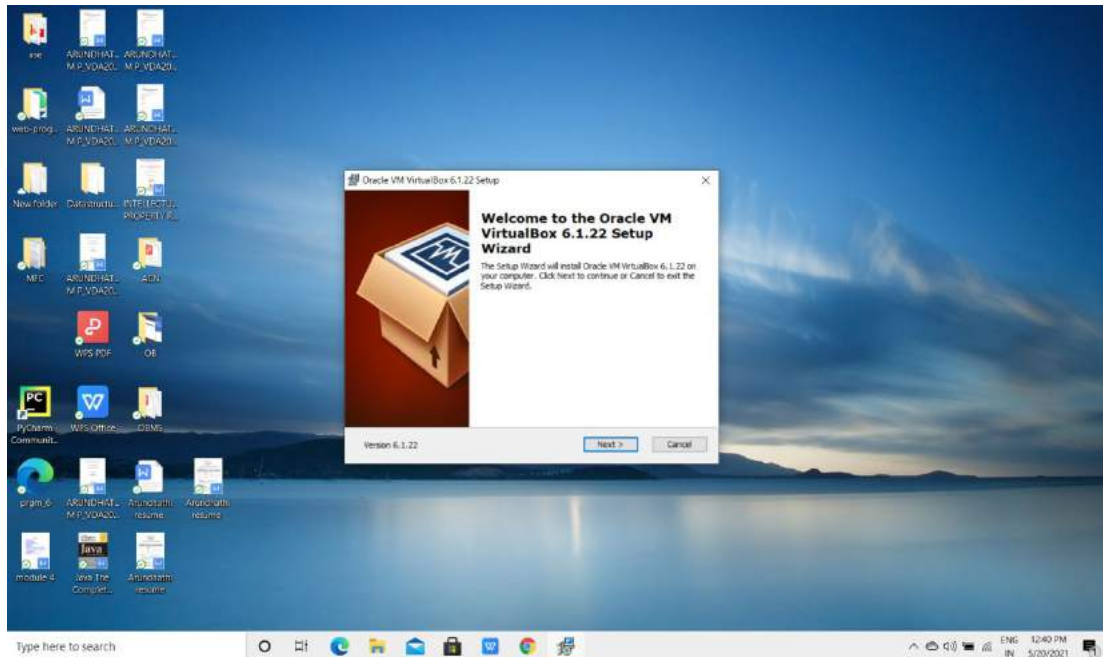
VIRTUAL BOX INSTALLATION

STEP 1:Go and search for virtual box in the browser.

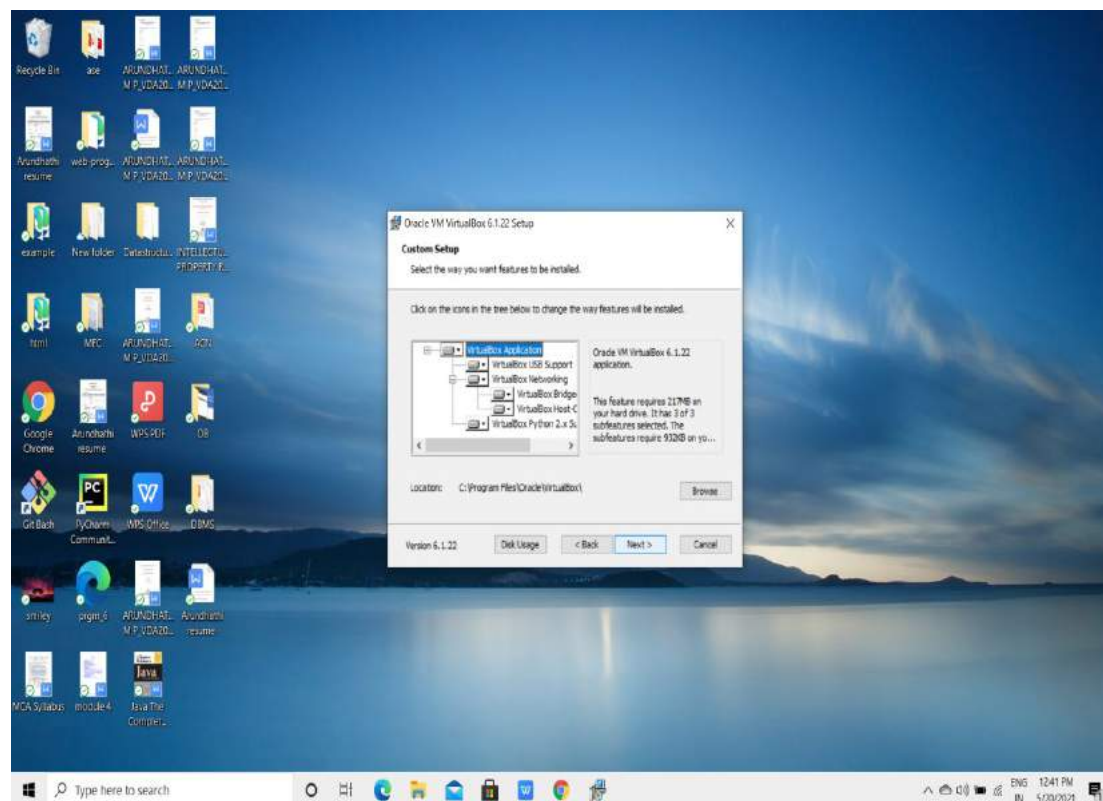
STEP 2:Download the virtualbox for windows.



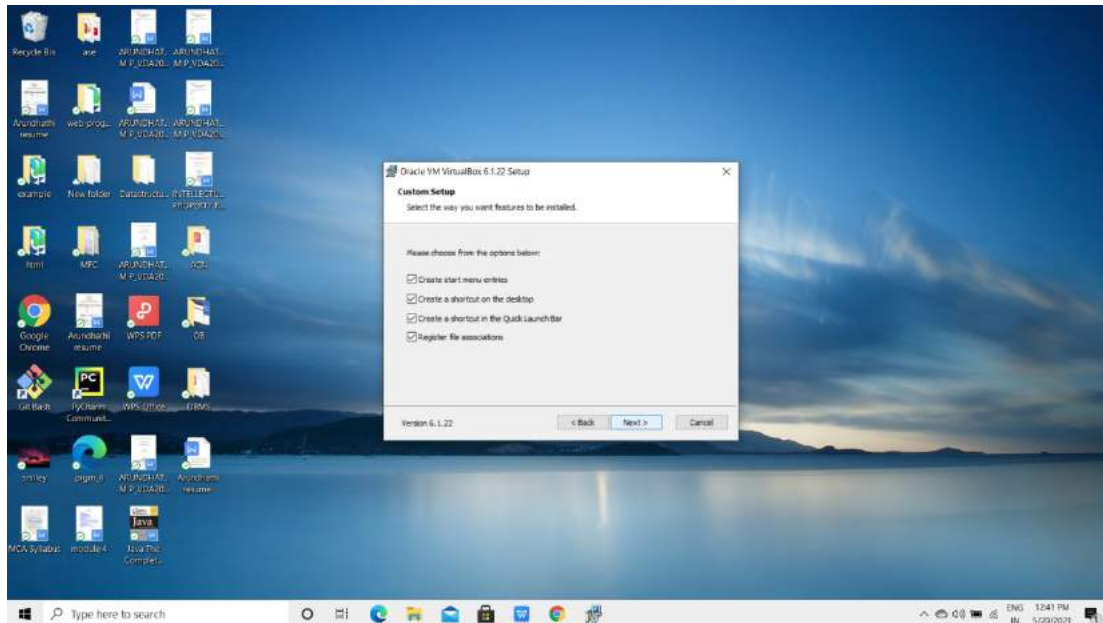
STEP 3: Virtualbox downloaded.



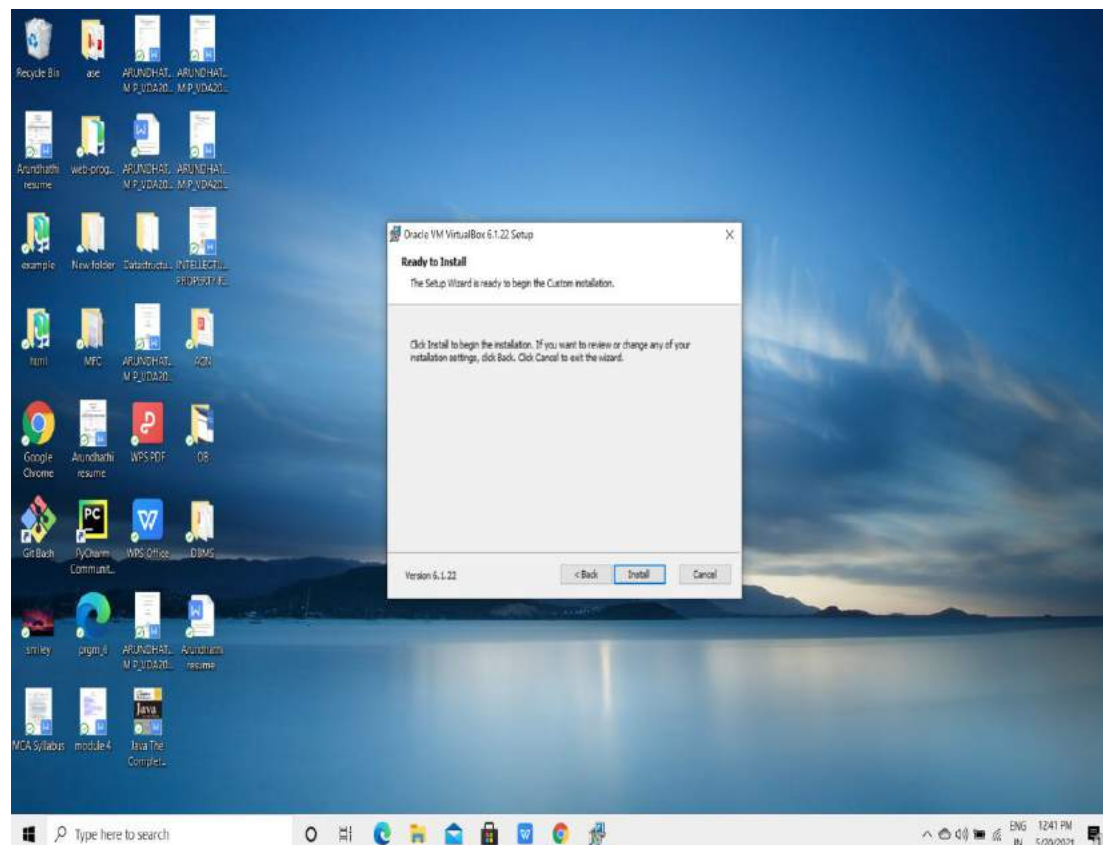
STEP 4: Click Next



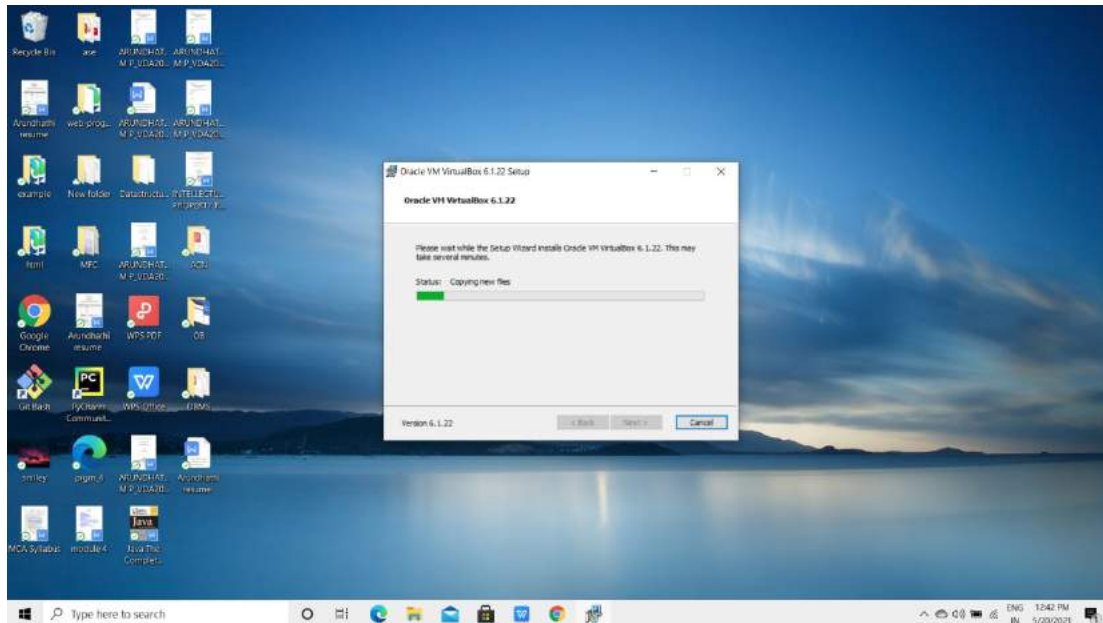
STEP 5: Click Next



STEP 6: Click YES and Click install.



STEP 7:Installing VirtualBox

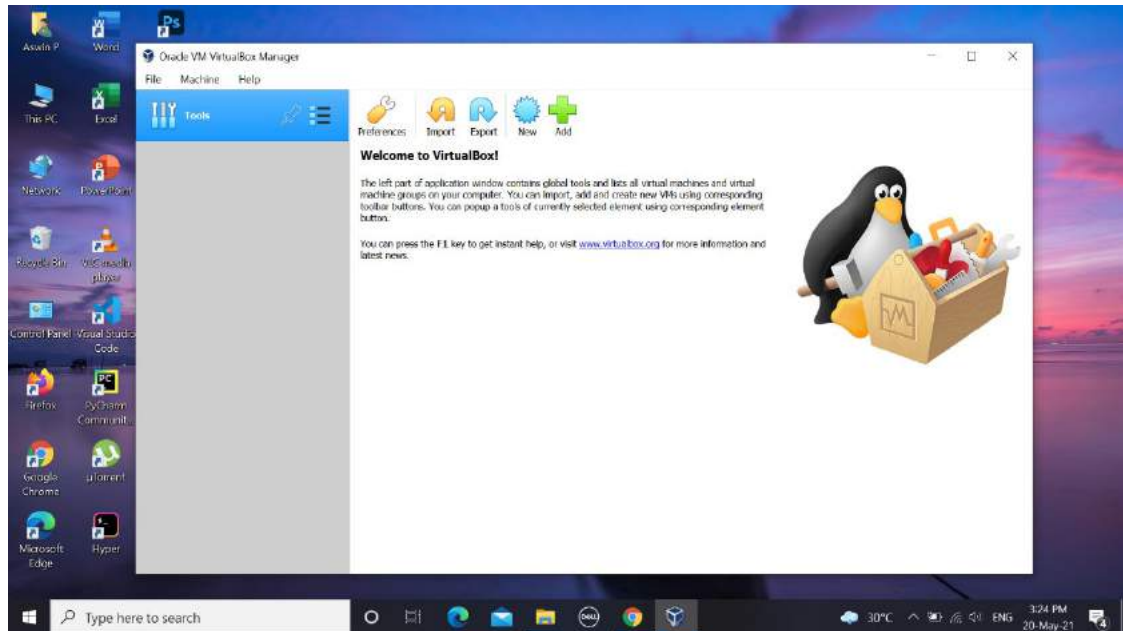


STEP 8:Installation is completed.Then Click on Finish.

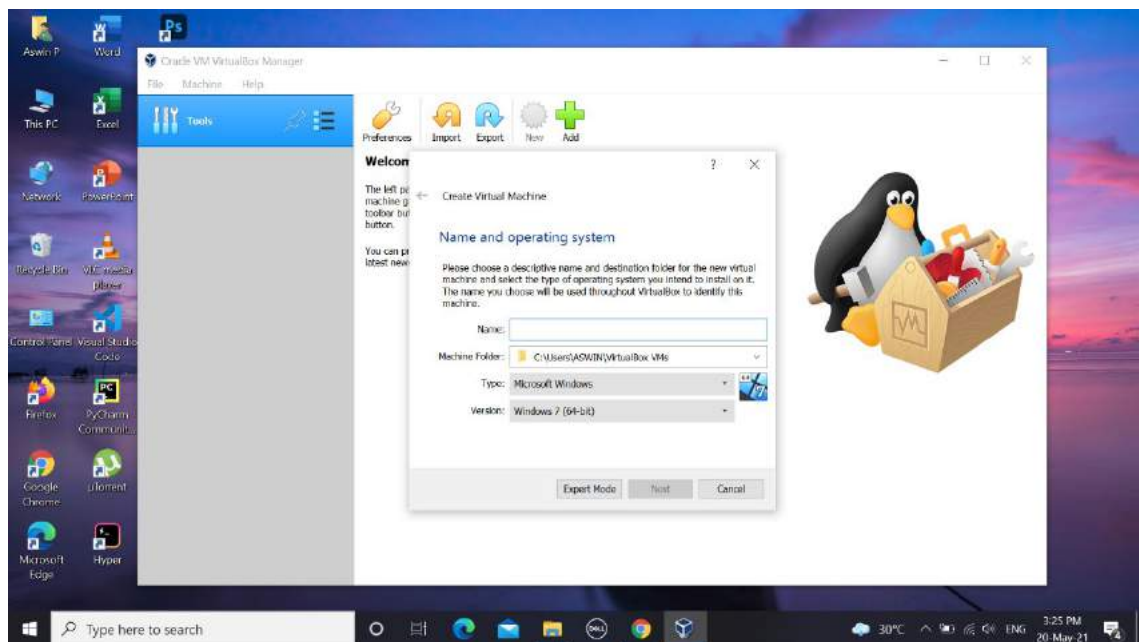


VIRTUALBOX SETUP

STEP 1: Next step is to Open VirtualBox

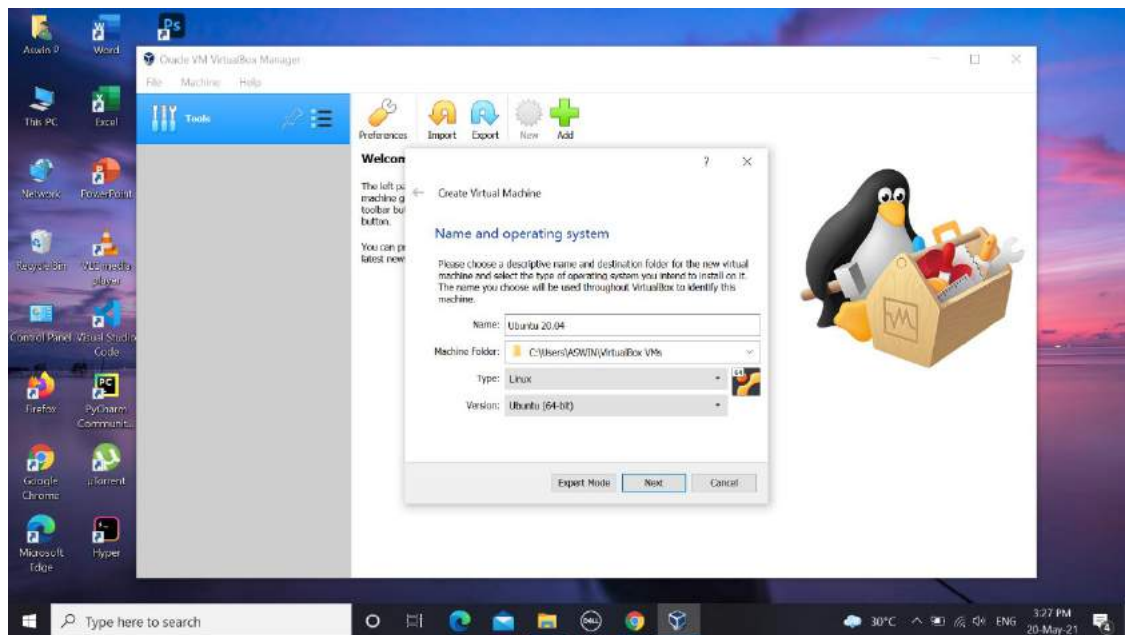


STEP 2: Click 'New' button to open a dialog.



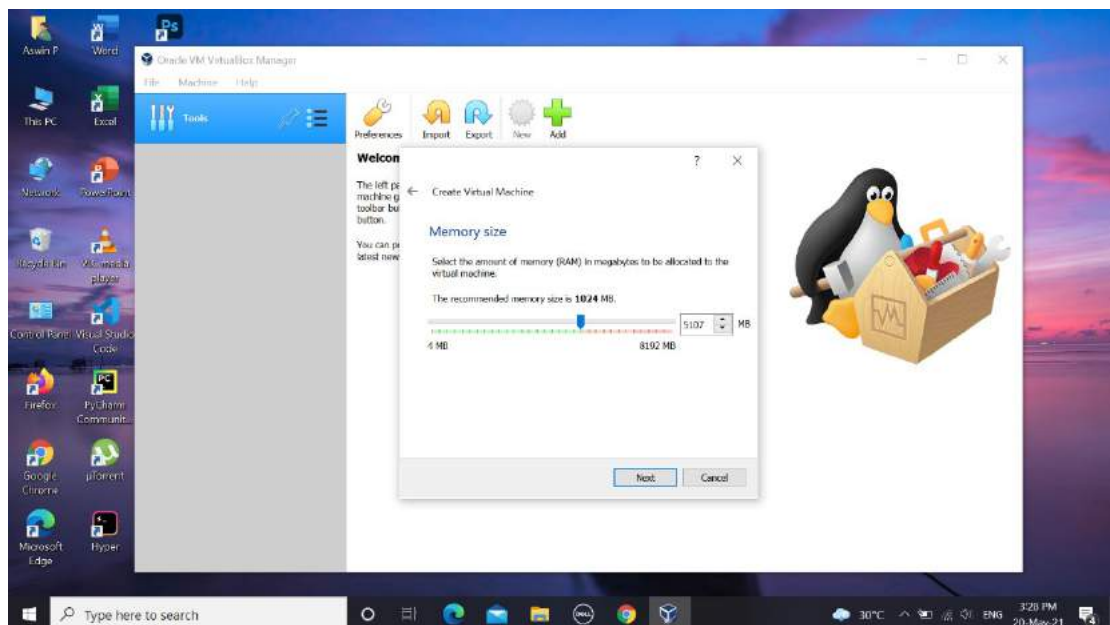
STEP 3 :Type a name for the new virtual machine.

VirtualBox automatically changes 'Type' to Linux and 'Version' Ubuntu .

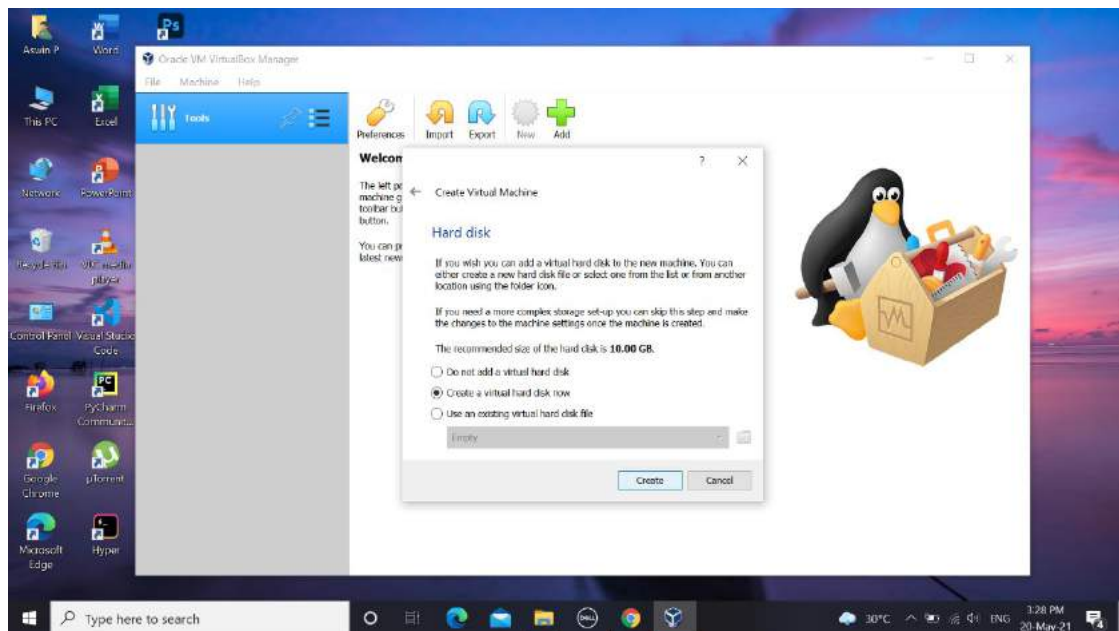


STEP 4:Click Next.Select theRAM to use.

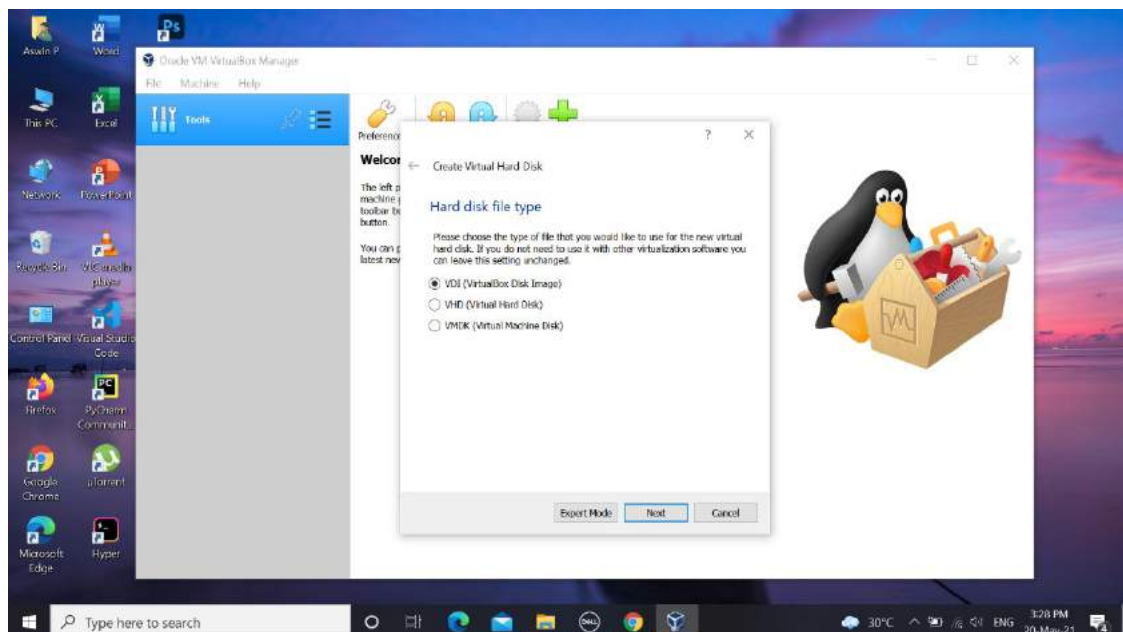
.Click and drag the slider left or right to decrease or increase the amount of RAM .



STEP 5: Accept the default 'Create a virtual hard drive now' and click 'Create' button.

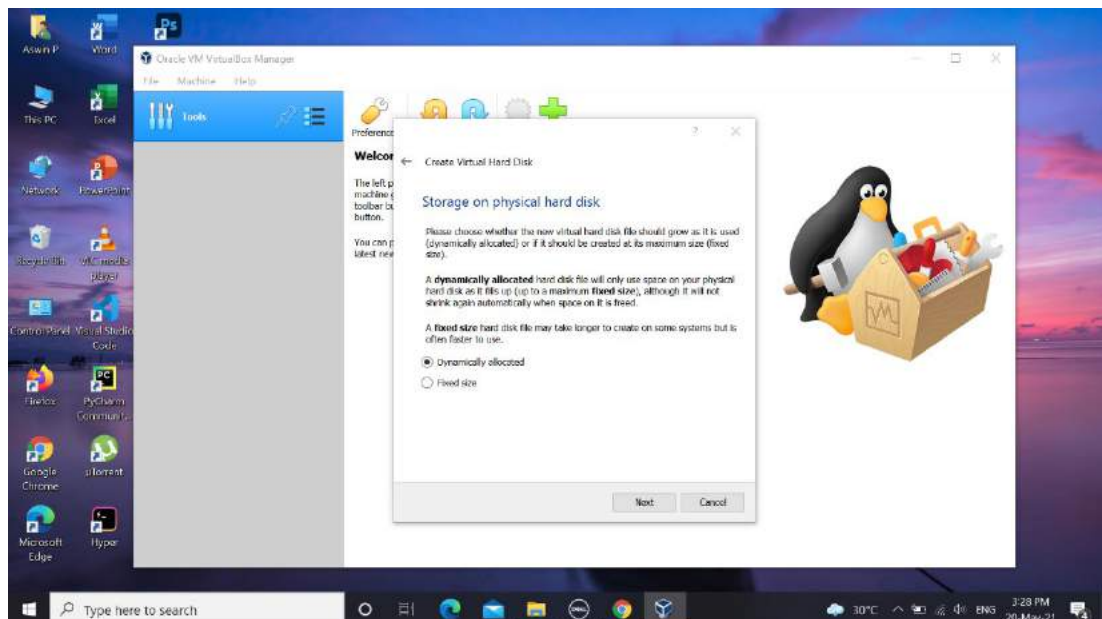


STEP 6: Continue to accept the default 'VDI' drive file type and click 'Next' button



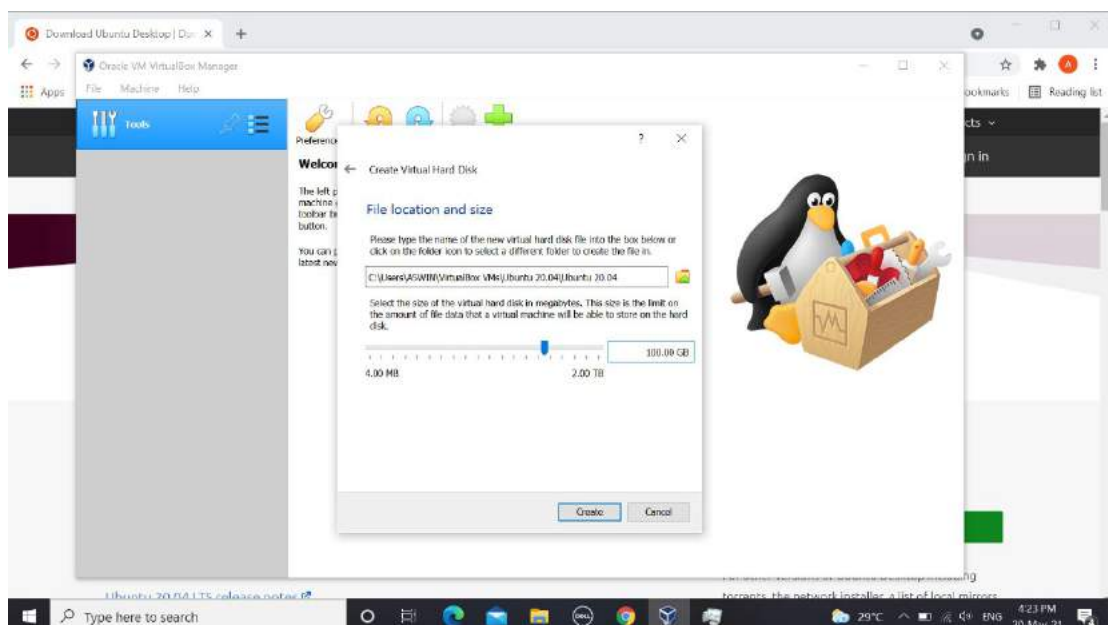
STEP 7: Storage type from the default is 'Dynamically allocated'

Click Next.



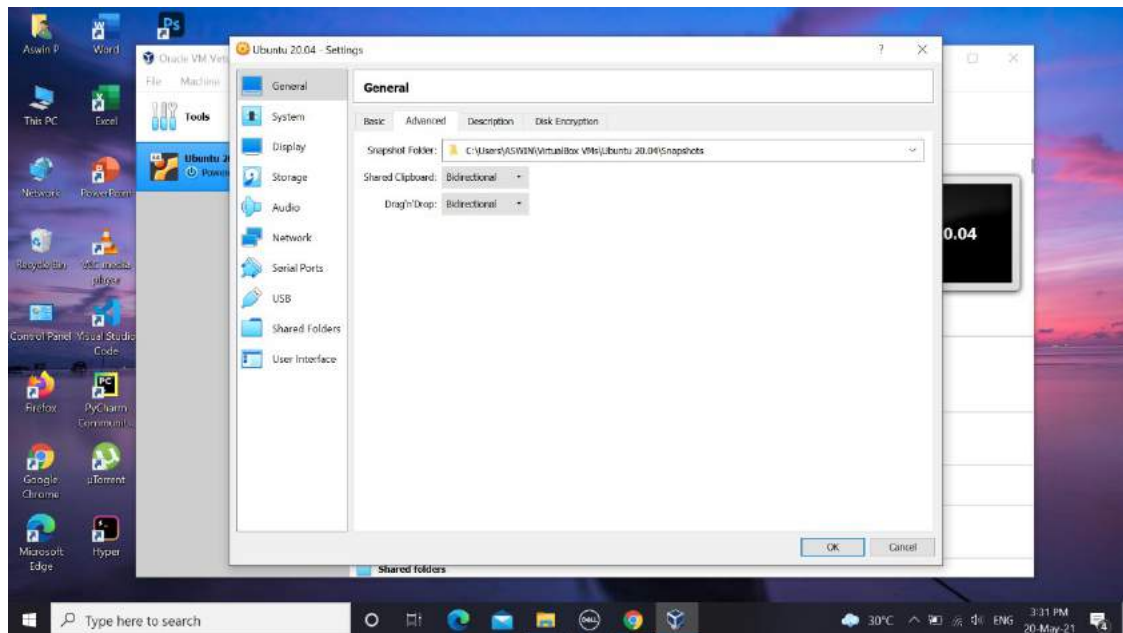
STEP 8: Enter the Size of Virtual Hard Drive. Give the size is equals to 100 GB .

Click Create

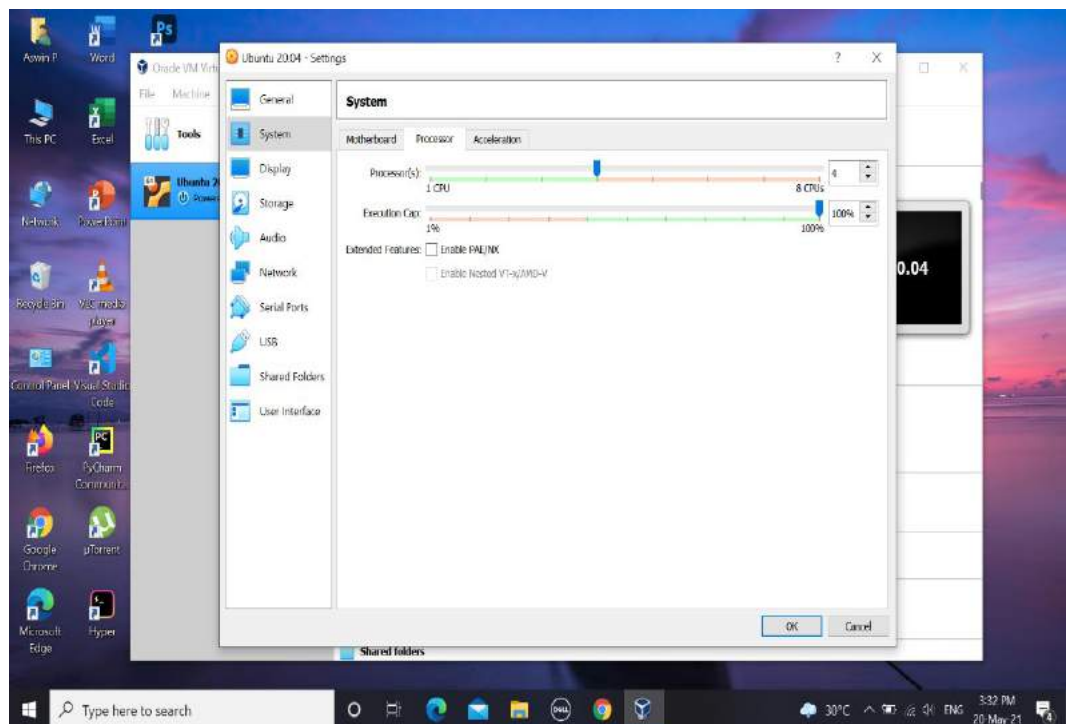


STEP 9: To start the virtual machine click on “Settings”.

Click on “General → Advanced”



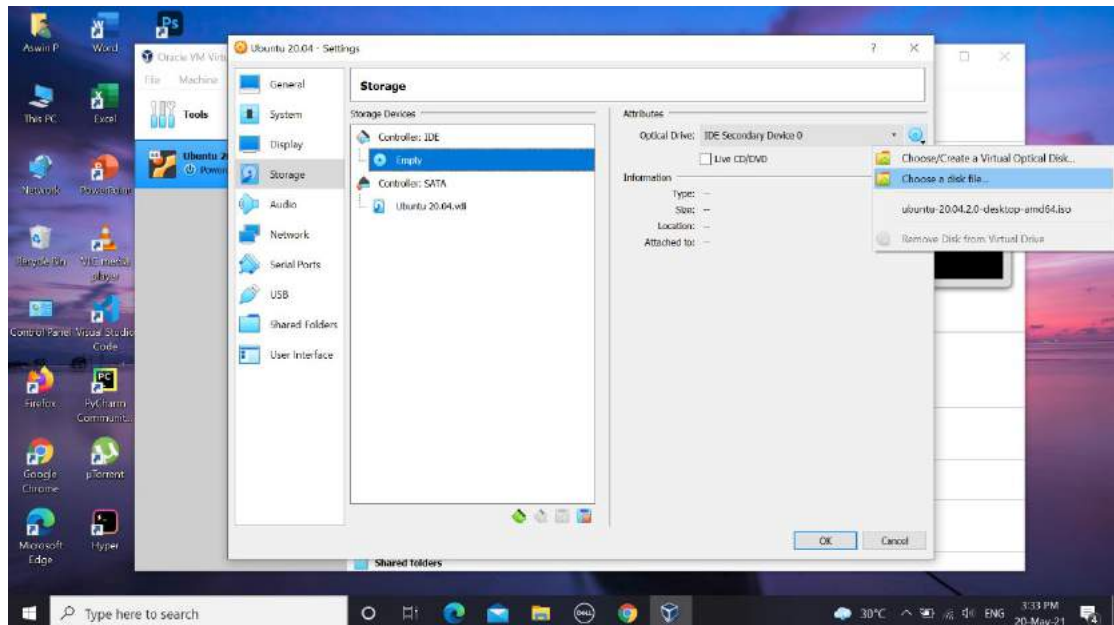
STEP 10: Click “System → Processor”



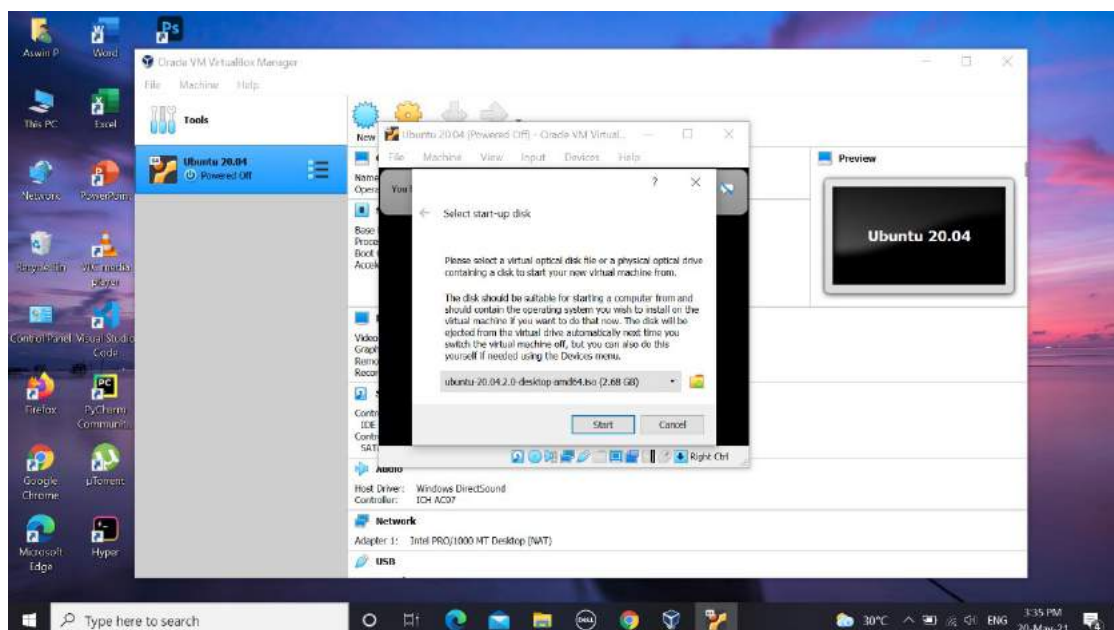
STEP 11:Click on “Storage → Controller IDE”.

Click the disk symbol.

Select disk file source to start an installation of OS.

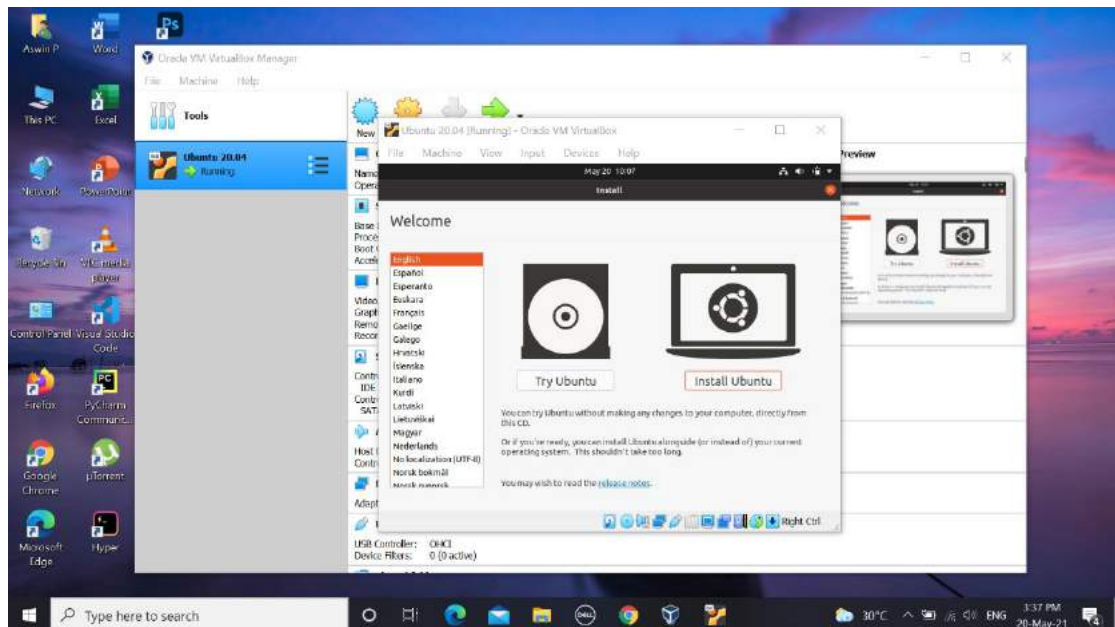


STEP 12: Click “Start”.

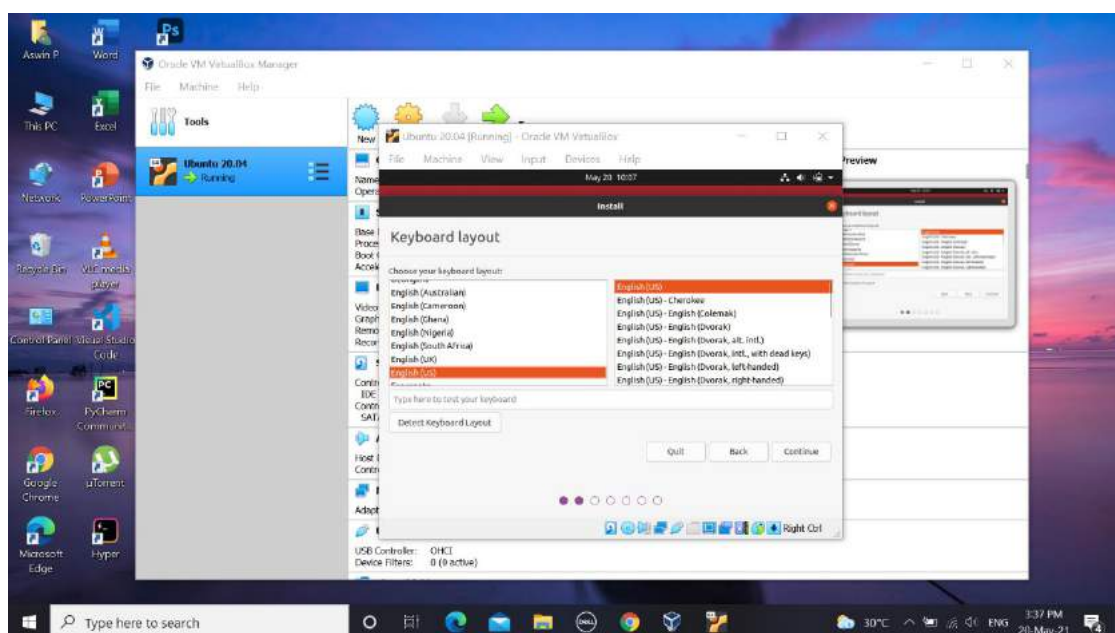


UBUNTU INSTALLATION

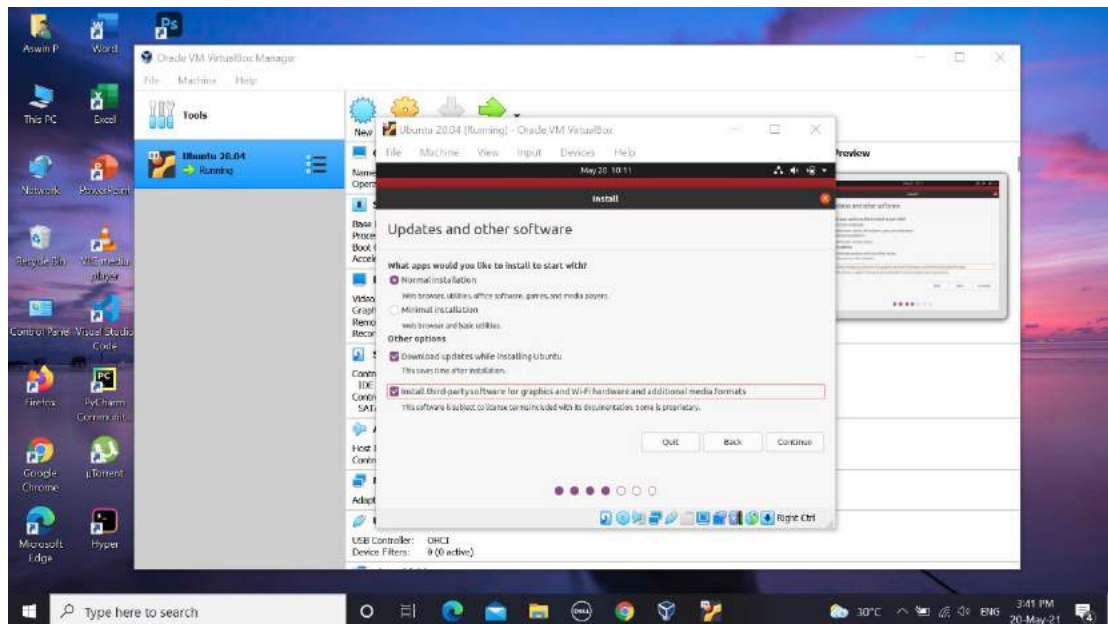
STEP 1: Click “Install Ubuntu”.



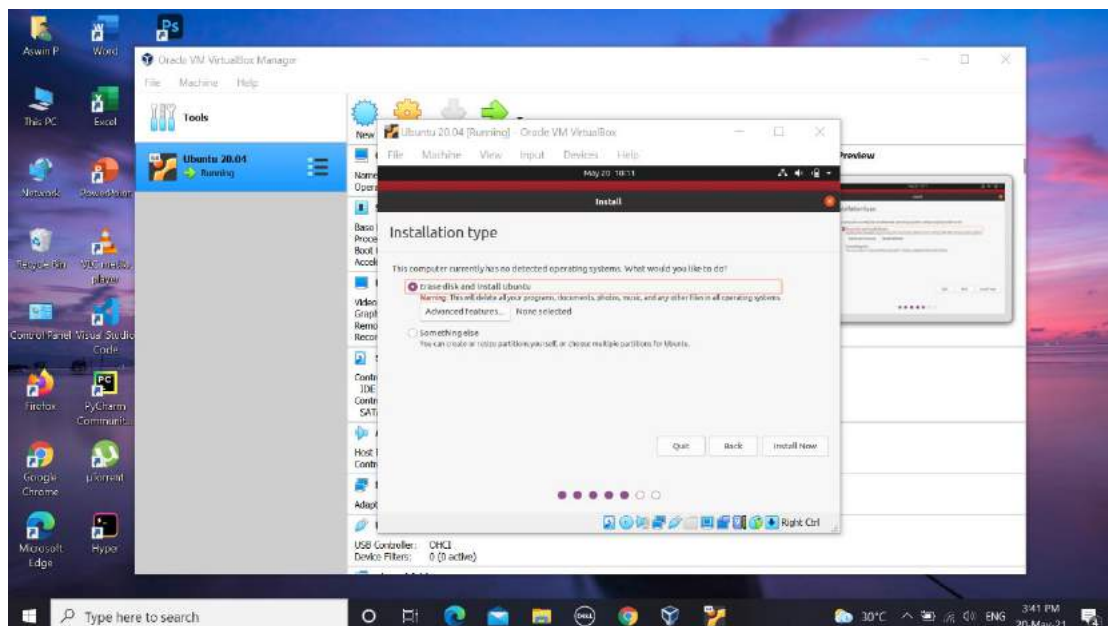
STEP 2: Select Keyboard layout for your machine.



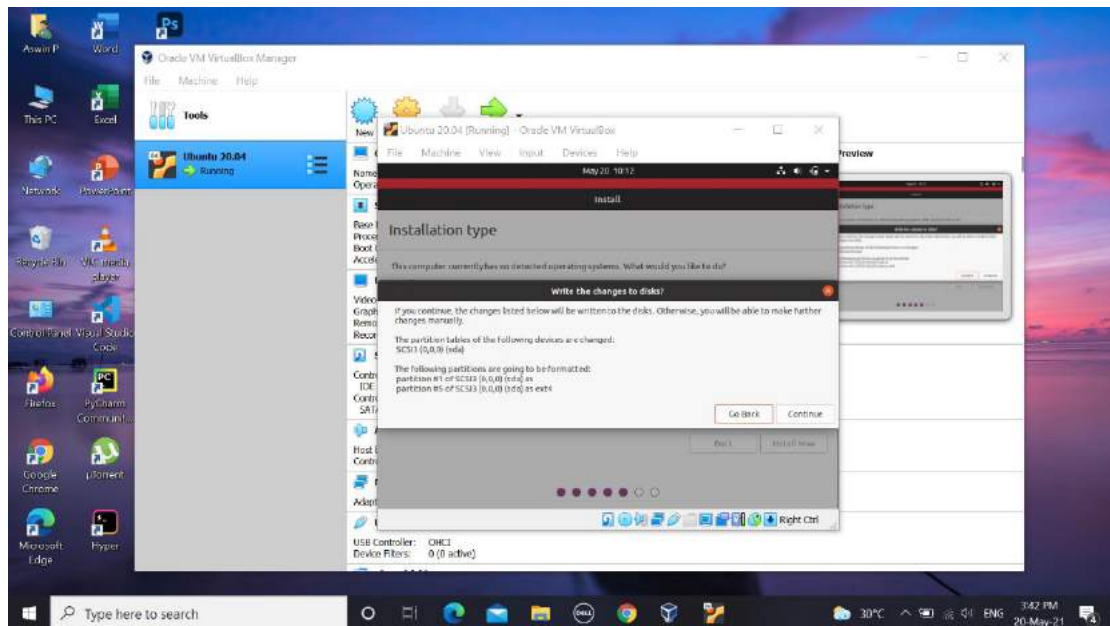
STEP 3:Click continue.



STEP 4: Check Erase disk and install ubuntu.

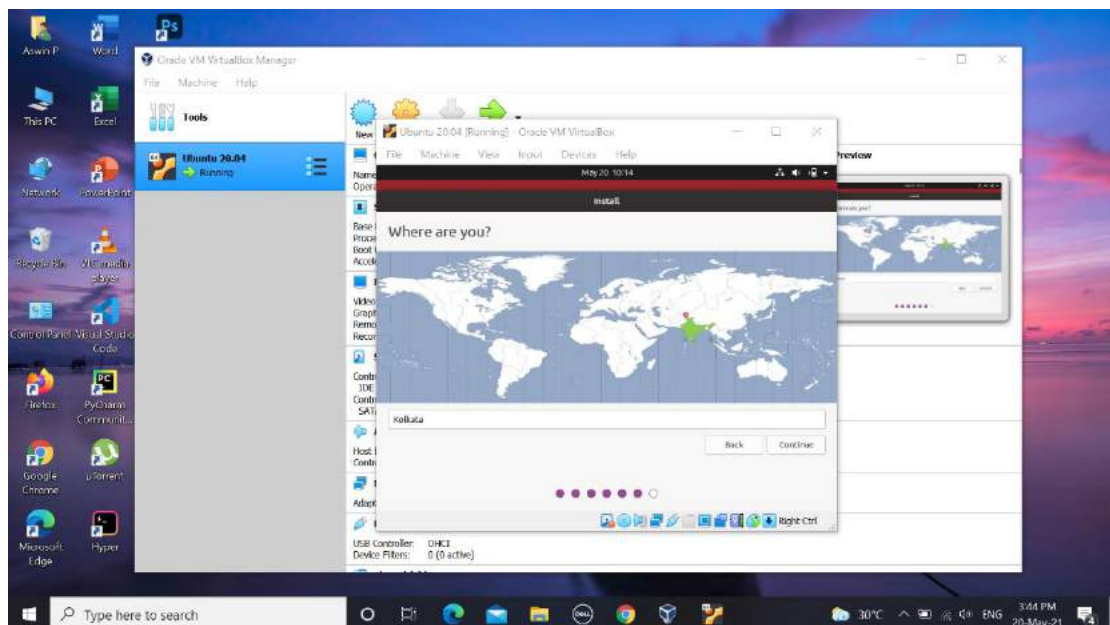


STEP 5:Click Continue.

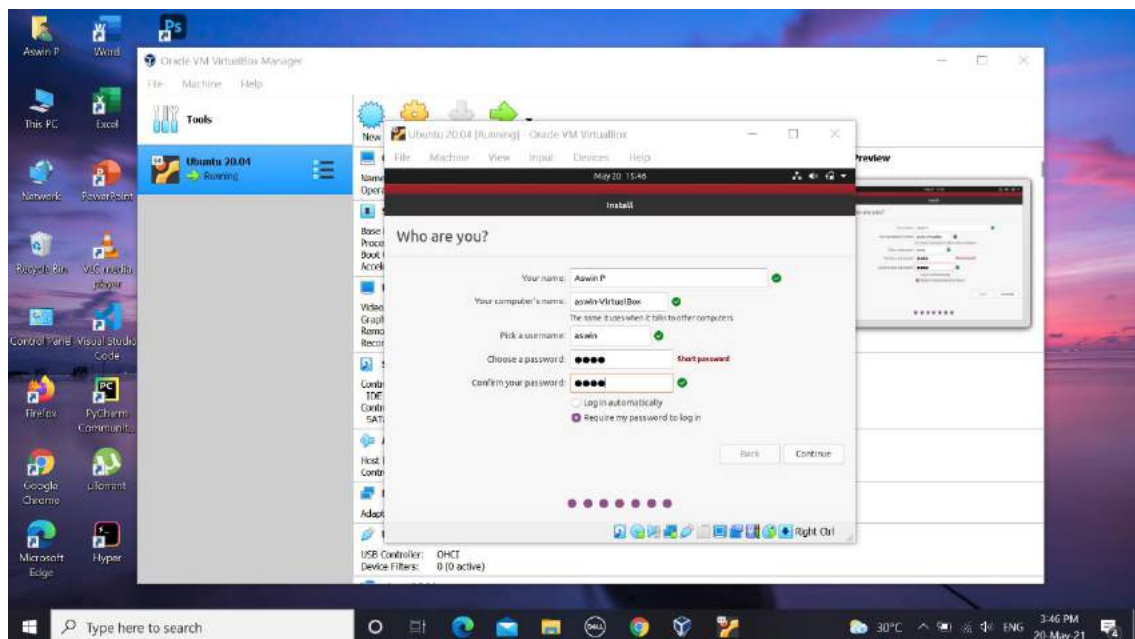


STEP 6: Select location.

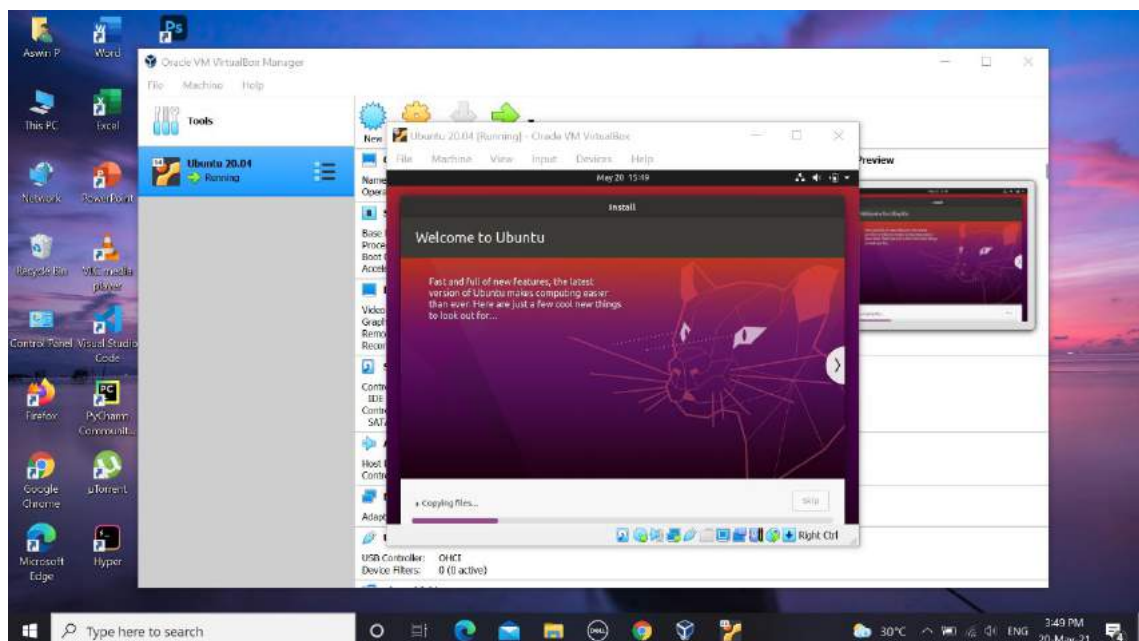
Click continue.



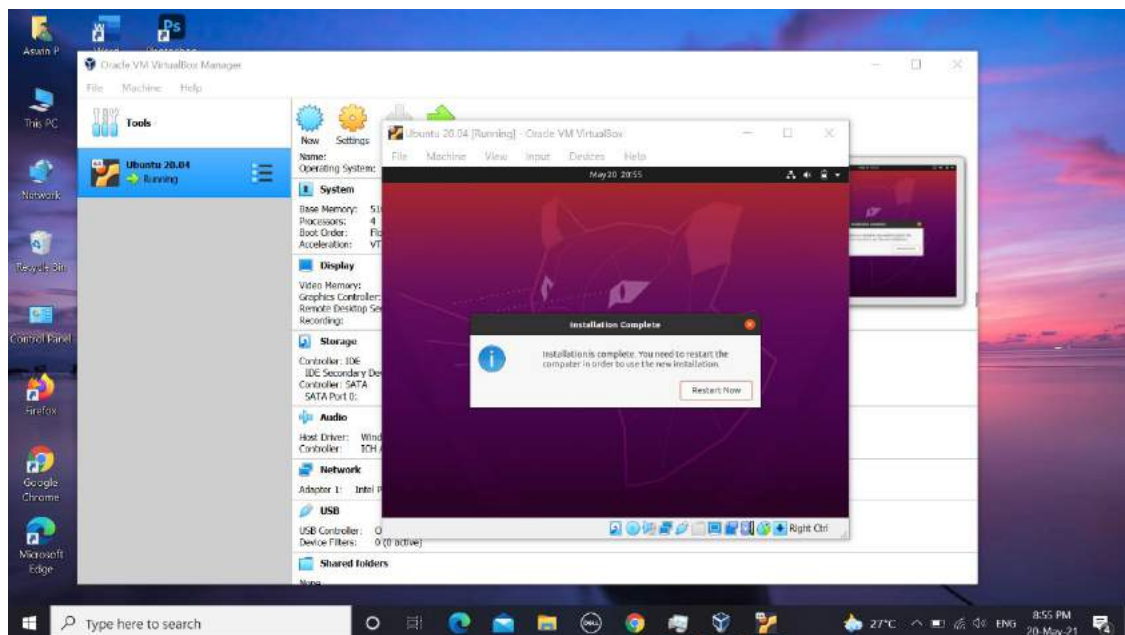
STEP 7: Click “Continue” before that fill the dialogue box.



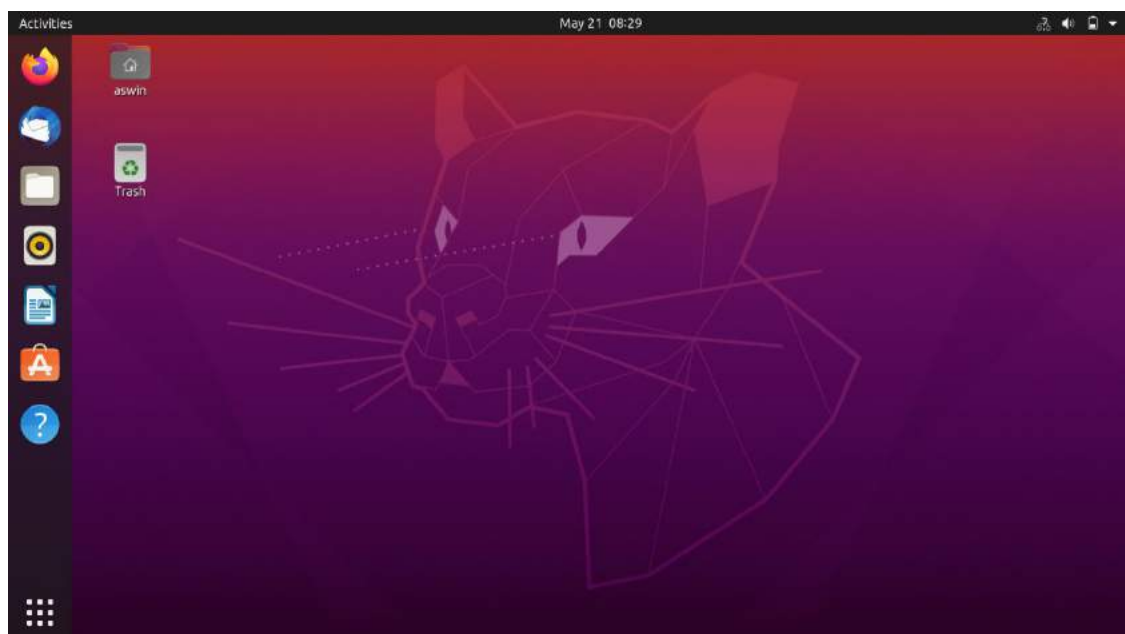
STEP 8: Installation started.



STEP 9: Click “Restart Now”.



STEP 10: Ubuntu is successfully installed.



Congratulations! You have successfully installed the world’s most popular Linux operating system!

It’s now time to start enjoying Ubuntu!!!.....