EXPERIMENT NO:1 **DATE:06-02-2024**

AIM: Introduction to Computer hardware: Physical identification of major components of a computer system such as mother board, RAM modules, daughter cards, bus slots, SMPS, internal storage devices,Interfacing ports. Specifications of desktop and server class computers. Installation of common operating systems for desktop and server use.

COMPUTER HARDWARE

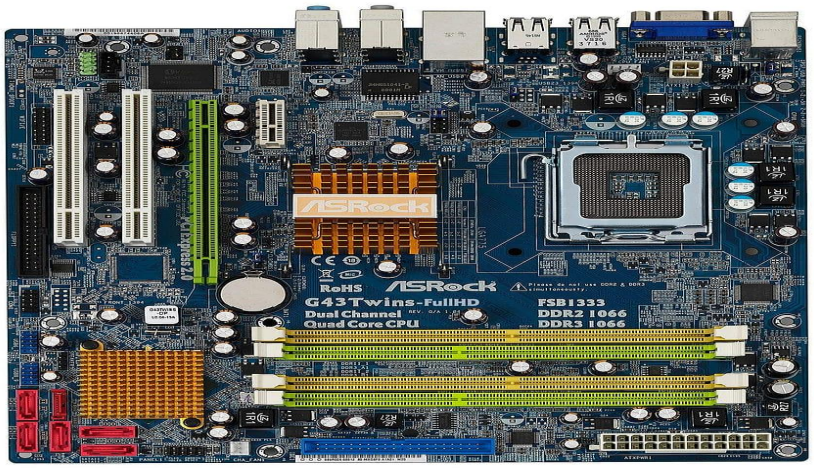
Computer hardware is a collective term used to describe any of the physical components of an analog or digital computer.The term hardware distinguishes the tangible aspects of a computing device from software,which consists of written, machine-readable instructions or programs that tell physical components what to do and when to execute the instructions.

Computer hardware includes the physical parts of a computer,such as the case,central processing unit(CPU),monitor,mouse,keyboard,computer data storage,graphics card,sound card,speakers and motherboard.

Hardware is typically directed by the software to execute any command or instruction. A combination of hardware and software forms a usable computing system, although other systems exist with only hardware.

MOTHERBOARD:

A motherboard(also called mainboard, main circuit board, MB, mboard, backplane board, base board, system board, mobo; or in Apple computers logic board) is the main printed circuit board (PCB) in general-purpose computers and other expandable systems. It holds and allows communication between many of the crucial electronic components of a system, such as the central processing unit(CPU) and memory, and provides connectors for other peripherals. Unlike a backplane, a motherboard usually contains significant sub-systems, such as the central processor, the chipset's input/output and memory controllers, interface connectors, and other components integrated for general use.



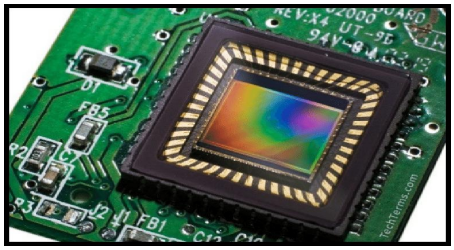
GPU(GRAPHICS PROCESSING UNIT):

A graphics processing unit (GPU) is a specialized electronic circuit initially designed to accelerate computer graphics and image processing(either on a video card,embedded on motherboards,mobile phones,personal computers, workstations, and game consoles).A GPU performs fast calculations of arithmetic and frees up the CPU to do different things.

CMOS(COMPLEMENTARY METAL OXIDE SEMICONDUCTOR):

Complementary metal–oxide–semiconductor (CMOS) is a type of metal oxide semiconductor field effect transisitor(MOSFET) fabrication process that uses complementary and symmetrical pairs of p-type and n-type MOSFETs for logic functions.

CMOS is a combination of NMOS and PMOS transistors that operates under the applied electrical field. The structure of CMOS was initially developed for high density and low power logic gates.



HDMI (HIGH DEFINITION MULTIMEDIA INTERFACE):

High-Definition Multimedia Interface(HDMI)is a proprietary audio/video interface for transmitting uncompressed video data and compressed or uncompressed digital audio data from an HDMI-compliant source device, such as a display controller, to a compatible computer monitor,video projector,digital television or digital audio device.

SMPS(SWITCHED-MODE POWER SUPPLY):

SMPS stands for Switched-Mode Power Supply. It is an electronic power supply that uses a switching regulator to convert electrical power efficiently. It is also known as Switching Mode Power Supply. It is power supply unit (PSU) generally used in computers to convert the voltage into the computer acceptable range.

RAM MODULES:

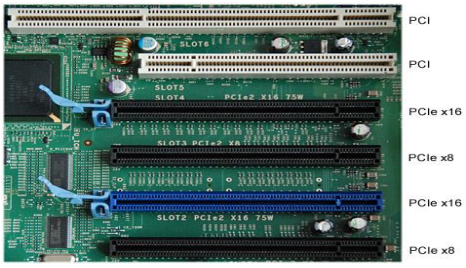
A memory module, also known as random access memory (RAM), is a crucial component of a computer that stores data temporarily. It allows your computer to quickly access and retrieve information needed for processing tasks.Memory modules permit easy installation and replacement in electronic systems,especially computers such as personal computers, word stations,and servers. The first memory modules were proprietary designs that were specific to a model of computer from a specific manufacturer.

DAUGHTER CARDS:

A daughterboard (or daughter board,daughter card or daughtercard) is a circuit board that plugs into and extends the circuitry of another circuit board. The other circuit board may be the computer's main board (its motherboard) or it may be another board or card that is already in the computer, often a sound card. The term is commonly used by manufacturers of wavetable daughterboards that attach to existing sound cards.

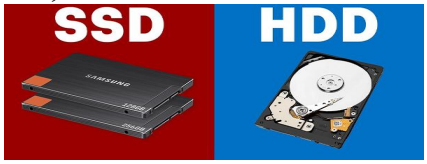
BUS SLOT:

Alternatively referred to as a bus slot or expansion port, an expansion slot is connection or port located inside a computer on the motherboard or riser board that allows a computer 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 expansion card and install that card into the compatible expansion slot.



STORAGE DEVICES:

A storage device is a kind of hardware, which is also known as storage, storage medium, digital storage, or storage media that has the ability to store information either temporarily or permanently. It is used to hold, port, and extract data files.



1)SSD (SOLID STATE DRIVE):

A solid-state drive (SSD) is a solid state storage device that uses integrated circuit assemblies to store data persistently, typically using flash memory, and functions as secondary storage in the hierarchy computer storage.It is also sometimes called a semiconductor storage device, a solid-state device, or a solid-state disk.SSD also has rich internal parallelism for data processing.

Following are several types of SSD:

SATA SSD: These are the most common type of SSDs and use the same interface as traditional hard drives. They are compatible with most laptops and desktops, but their performance is limited by the SATA interface.

M.2 SSD: M.2 SSD are smaller in size than traditional SATA SSD and are commonly used in ultra-thin laptops and tablets. They use either the SATA or NVMe interface, depending on the model.

mSATA SSD: Its mini version of SATA. It has a smaller form factor mainly used in ultra-compact computers, laptops, mobile devices with an mSATA slot, in which the installation of an extended size SATA SSD is impossible.

1) HDD (HARD DISK DRIVE):

A hard disk drive (HDD) is an internal or external computer component that stores data, such as the operating system, applications, and user files.HDDs are “non-volatile” storage devices, meaning they retain stored data even when power isn't being supplied.HDD means data is retained when our computer system is shut
down.HDD is an electro mechanical storage device, which is an abbreviation of hard disk drive. It uses magnetic storage for storing and retrieving the digital data.

INPUT DEVICES

An input device is a computer device or hardware that allows the user to provide data, input, and instructions to the computer system. Data is provided to the computer system in a raw format which is then converted into a computer-understandable language by the input devices. The central processing unit then processes the data to produce output. In other words, an input device is a kind of peripheral device that helps the users communicate with the computer system.

Keyboard: Keyboard is the most common and very popular input device which helps to input data to the computer. The layout of the keyboard is like that of traditional typewriter, although there are some additional keys provided for performing additional functions.

Mouse: Mouse is the most popular pointing device. It is a very famous cursor-control device having a small palm size box with a round ball at its base, which senses the movement of the mouse and sends corresponding signals to the CPU when the mouse buttons are pressed.

Joystick: Joystick is also a pointing device, which is used to move the cursor position on a monitor screen. It is a stick having a spherical ball at its both lower and upper ends. The lower spherical ball moves in a socket. The joystick can be moved in all four directions.

Track Ball: Track ball is an input device that is mostly used in notebook or laptop computer, instead of a mouse. This is a ball which is half inserted and by moving fingers on the ball, the pointer can be moved.

Scanner: Scanner is an input device, which works more like a photocopy machine. It is used when some information is available on paper and it is to be transferred to the hard disk of the computer for further manipulation.

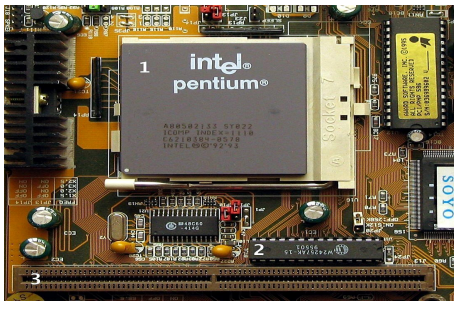
Microphone: Microphone is an input device to input sound that is then stored in a digital form.

PROCESSING UNIT

The part of a computer that performs logical and arithmetical operation on the data as specified in the instructions.

1) CPU (CENTRAL PROCESSING UNIT):

CPU is considered as the brain of the computer.CPU performs all types of data processing operations.It stores data, intermediate results, and instructions (program).It controls the operation of all parts of the computer.

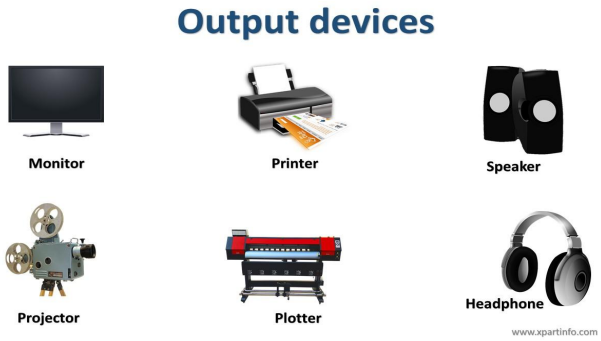


2) RAM (RANDOM ACCESS MEMORY):
RAM, which stands for Random Access Memory, is a hardware device generally located on the motherboard of a computer and acts as an internal memory of the CPU. It allows CPU

store data, program, and program results when you switch on the computer. It is the read and write memory of a computer, which means the information can be written to it as well as read from it.

OUTPUT DEVICES/UNITS

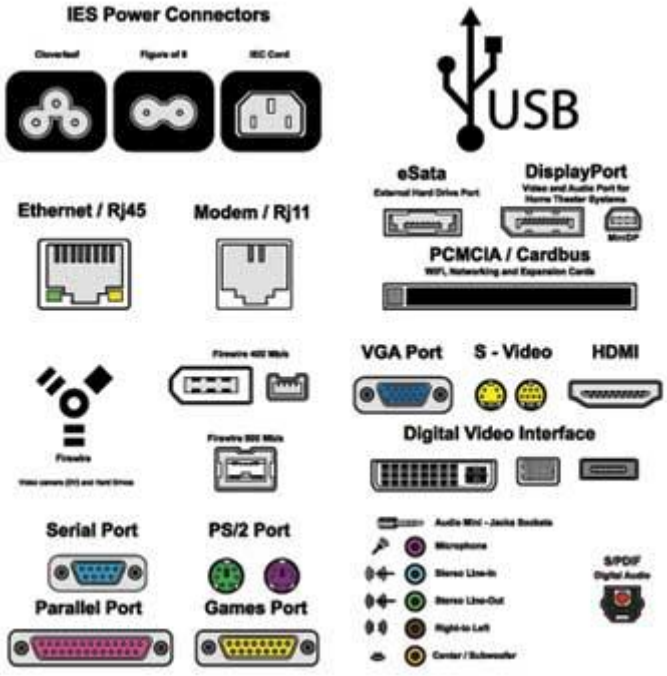
An output device is a hardware component of a computer system that displays information to users. An output device is a computer hardware device that retrieves and presents the result of the inserted input data from the computer system and further translates that data into human-understandable language. The output or result is then presented to us in the form of text, visuals, audio or a hard copy (printed on paper).



Monitor: It is also known as a Visual Display Unit (VDU) and the major function of a monitor is to display the processed data like images, videos, text, audio, etc. A monitor arranges the microscopic dots known as pixels in a rectangular pattern to make images.
Printer: Printers primarily operate by producing a copy, typically a hard copy or Xerox copy, of the information transmitted by the computer. The printer receives electronic data from the computers and produces a hard copy of the processed data.
Projector: The projector is an output device that receives images from a computer and allows users to project their output onto a large area, such as a screen or a wall. The computer first sends the signal to a video card which then transmits the signal to the projector to project the images on the surface.
Speakers: Speakers are the output devices that are connected to computers to allow sound to be output. For the working of speakers, sound cards send signals to the speakers which are converted into audio.

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.



DESKTOP

The desktop is a basic element of a personal computer that represents different types of objects, including project folders, reference sources, drawing tools, documents, writing tools, phone books, telephones. It is the primary user interface of a computer that might be found on top of a physical desk. The desktop display is that the default display and displayed once the start up process is complete at the time of booting the system.The most common configuration has a case that houses the power supply, motherboard (a printed circuit board with a microprocessor as the central processing unit, memory, bus, certain peripherals and other electronic
components), disk storage (usually one or more hard disk drives, solid state drives, optical disc drives, and in early models a floppy disk drive); a keyboard and mouse for input; and a computer monitor, speakers, and, often, a printer for output.The case may be oriented horizontally or vertically and placed either underneath, beside, or on top of a desk.

SERVER OPERATING SYSTEM

A server operating system is a type of operating system that is designed to be installed and used on a server computer. It is advanced version of operating system, having features and capabilities required within a client-server architecture or similar enterprise computing environment.
Example: Windows Operating System, Linux Operating System

DATA SERVER:A data server (DS) is a software program/platform used to provide database services like storing, processing and securing data. These database services are consumed by other software programs or components. Sometimes the computer hardware, where the database is running, is also referred to as a database server. Therefore, the data server can be seen as the combination of software and hardware platform that runs
the installed database and provides relevant services.
Mainly three types:

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.

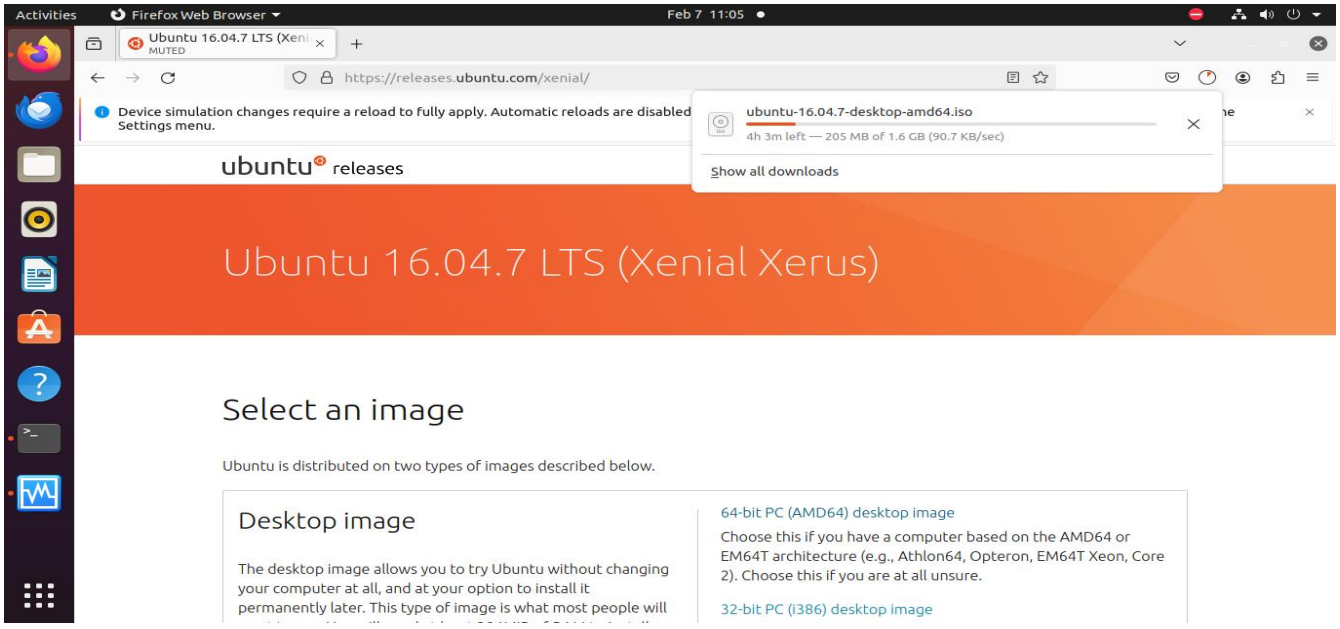
Mail server:A mail server is a central computer that stores electronic emails for clients over the network. It is much like the post office that obtains emails sent to the user and stores them until it is not requested by a user. It uses standard email protocols to send and receive an email like, simple 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.

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.

INSTALL UBUNTU ON VIRTUALBOX

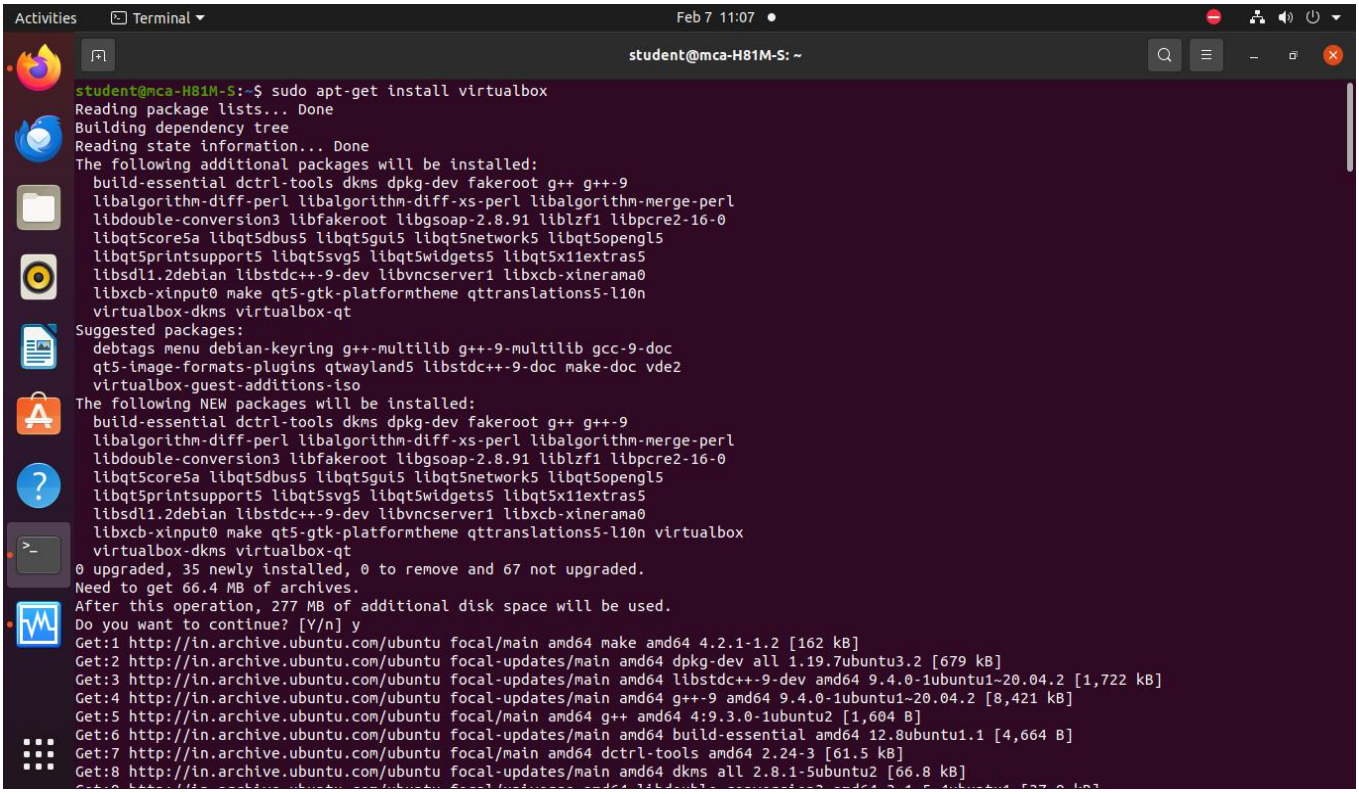
VirtualBox is a free and open-source software program for virtualizing the x86 computing architecture. Oracle Corporation developed it. It works as a hypervisor and develops a Virtual Machine where the user can run another operating system. The "host" OS is the operating system where VirtualBox runs. The "guest" OS is the operating system running on the Virtual Machine. As the host OS, VirtualBox supports Windows, Linux, Solaris, Open Solaris, and MacOS.

Before we begin with a installation process,we need to download **ISO** for **ubuntu**.

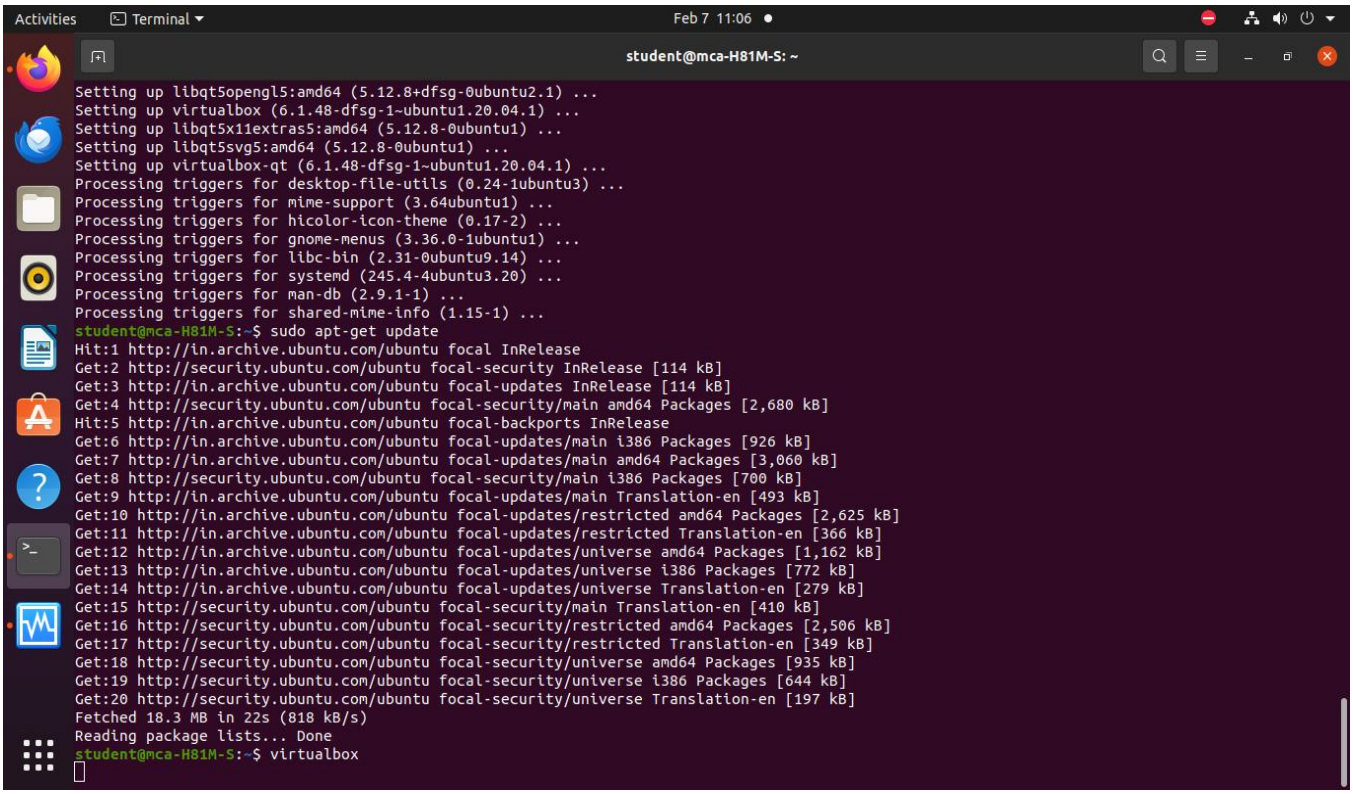


Virtual Box Installation:

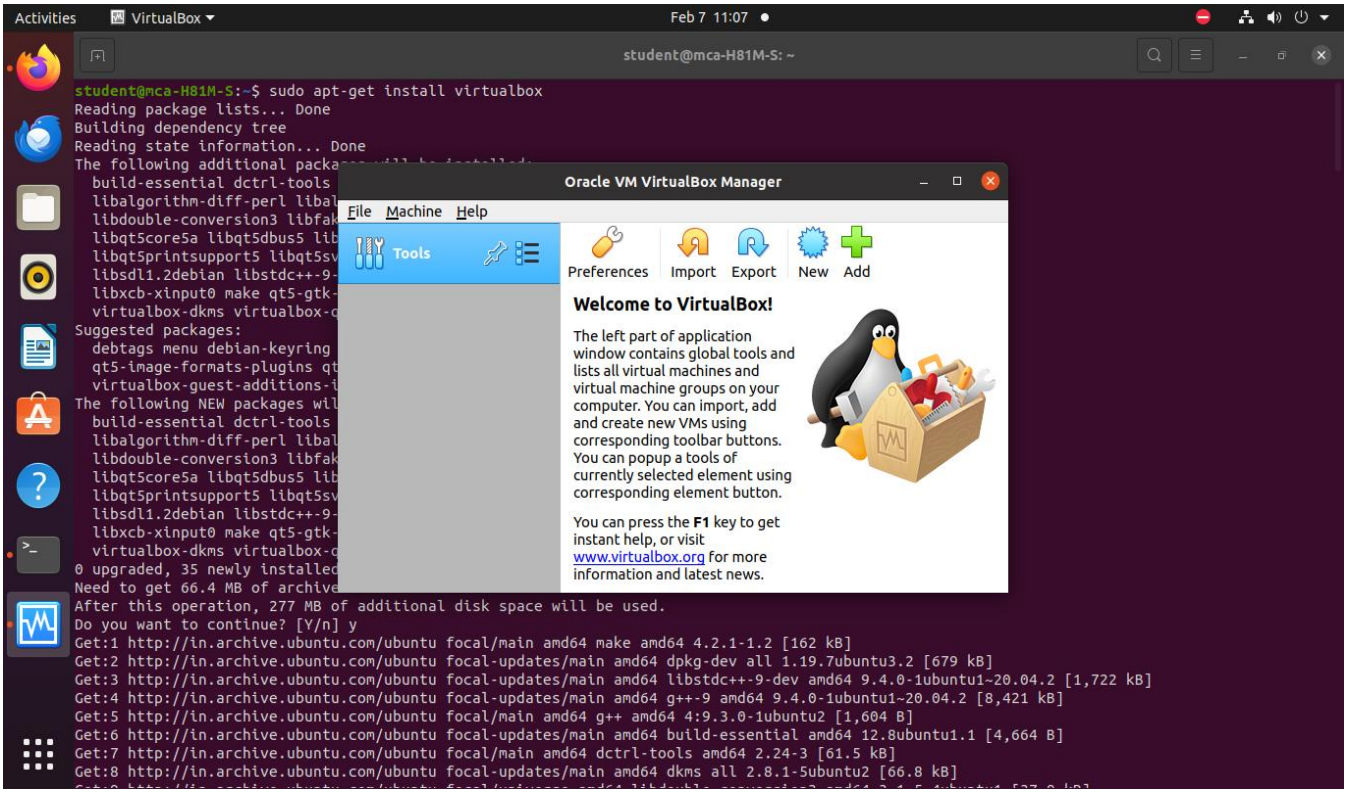
sudo apt-get install virtualbox



sudo apt-get update



Create virtual machine by just clicking on this new
Click -> new
we can install ubuntu so type ubuntu And choose the type


Activities
VirtualBox
Feb 7 11:07
student@mca-H81M-S: ~
student@mca-H81M-S:~$ sudo apt-get install virtualbox
Reading package lists... Done
Building dependency tree
Reading state information... Done
Oracle VM VirtualBox Manager
File Machine Help
Tools
Preferences
Import
Export
New
Add
Welcome to VirtualBox!
The left part of application window contains global tools and lists all virtual machines and virtual machine groups on your computer. You can import, add and create new VMs using corresponding toolbar buttons. You can popup a tools of currently selected element using corresponding element button.
You can press the F1 key to get instant help, or visit www.virtualbox.org for more information and latest news.
After this operation, 277 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu focal/main amd64 make amd64 4.2.1-1.2 [162 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 dpkg-dev all 1.19.7ubuntu3.2 [679 kB]
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