INTRODUCTION TO IT SYSTEMS LAB

FOR DIPLOMA STUDENTS

JHARSUGUDA ENGINEERING SCHOOL, JHARSUGUDA

INFORMATION TECHNOLOGY DEPARTMENT

INTRODUCTION TO IT SYSTEMS

UNIT-1 LECTURE-1
COMPUTER HARDWARES

By: Subrata Parida
IT Dept.

Syllabus

Course Content:-

UNIT 1: Basic Internet skills: Understanding browser, efficient use of search engines, awareness about Digital India portals (state and national portals) and college portals.

General understanding of various computer hardware components – CPU, Memory, Display, Keyboard, Mouse, HDD and other Peripheral Devices.

UNIT 2: OS Installation (Linux and MS Windows), Unix Shell and Commands, vi editor.

UNIT 3: HTML4, CSS, making basic personal webpage.

UNIT 4: Office Tools: Open Office Writer, Open Office Spreadsheet (Calc), Open Office Impress.

UNIT 5: Information security best practices. Class lectures will only introduce the topic or demonstrate the tool, actual learning will take place in the Lab by practicing regularly.

Objective

COURSE OBJECTIVES:

This course is intended to make new students comfortable with computing environment - Learning basic computer skills, Learning basic application software tools, Understanding Computer Hardware, Cyber security awareness.

Outcome

COURSE OUTCOMES:

At the end of the course student will be able to comfortably work on computer, install and configure OS, assemble a PC and connect it to external devices, write documents, create various worksheets, prepare presentations, protect information and computers from basic abuses/ attacks.

Contents of UNIT: 1

1. BASIC COMPUTER & INTERNET SKILLS

1.1 General understanding of various computer components: Block Diagram of Computer

1.1.1 CPU, Memory, Display, Keyboard, Mouse

1.1.2 HDD and Pen Drive

1.1.3 Peripheral Devices (Printers, Scanners, Web camera & Barcode Reader)

1.2 Computer Languages: Machine, Assembly & High-level Language

1.3 Computer & Communication: Meaning of Web Address, URL, IP address, E-mail

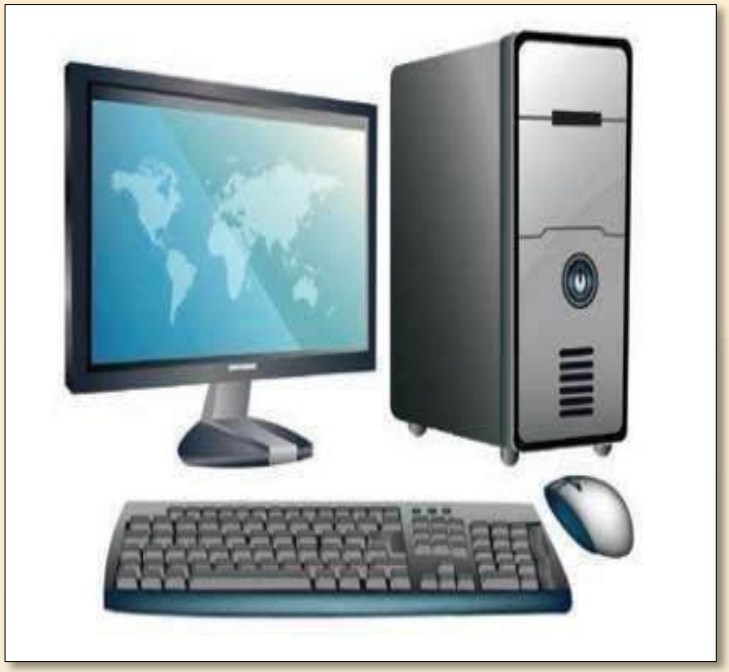
1.4 Awareness about Digital India portals (state and national portals) and college portals.

Introduction to Computer

Computers are seen everywhere around us, in all spheres of life, in the field of education, research, travel and tourism, weather forecasting, social networking, e-commerce etc Computers have now become an indispensable part of our lives.

Computers have revolutionized our lives with their accuracy and speed of performing a job, it is truly remarkable.

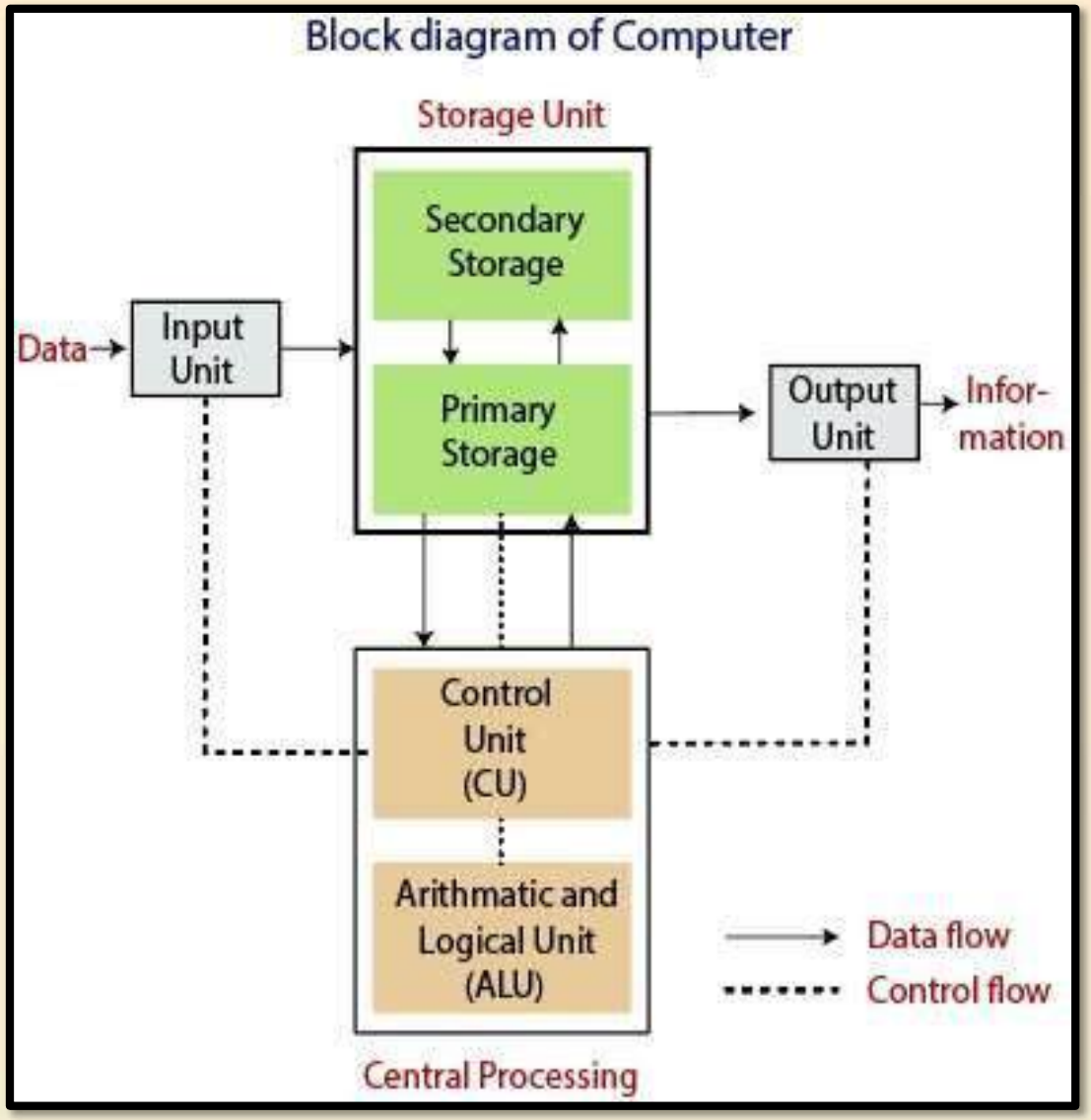
Today, no organization can function without a computer. In fact, various organizations have become paperless. Computers have evolved over the years from a simple calculating device to high speed portable computers.



Definition: It is an electronic device that processes the input according to the set of instructions provided to it and gives the desired output at a very fast rate

Working: A computer can take data from the user through input devices (Input), process the user given data (Processing), produces the result to the user through output devices (Output)and stores data (Information) for future use

Block Diagram of Computer



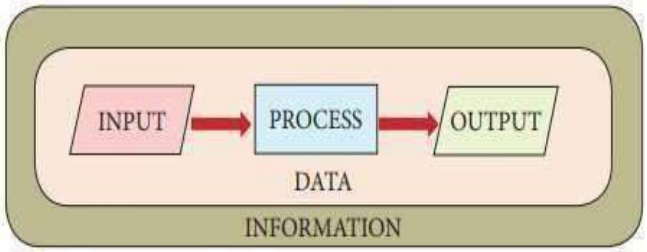
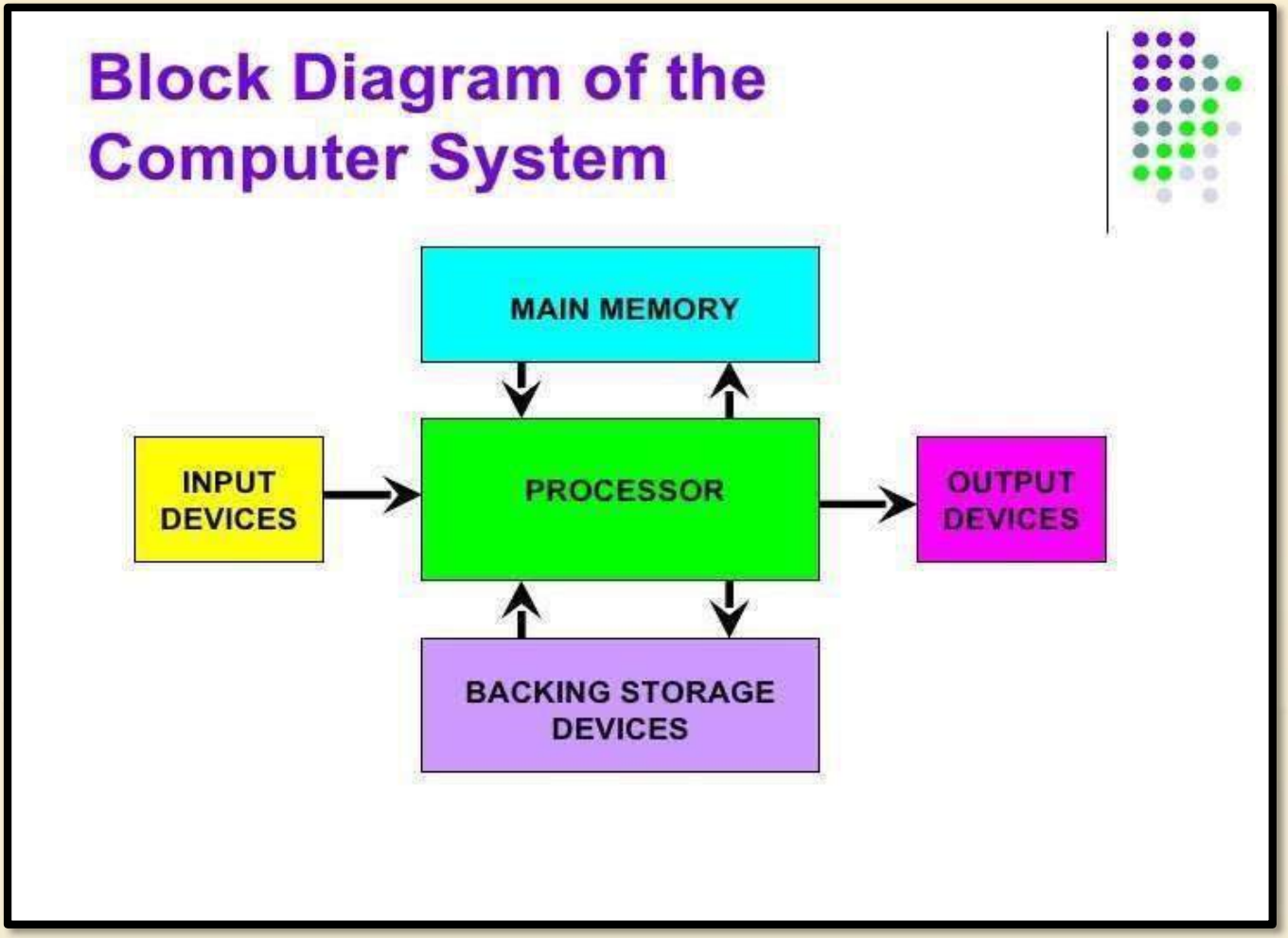


Figure 1.1 Data and Information

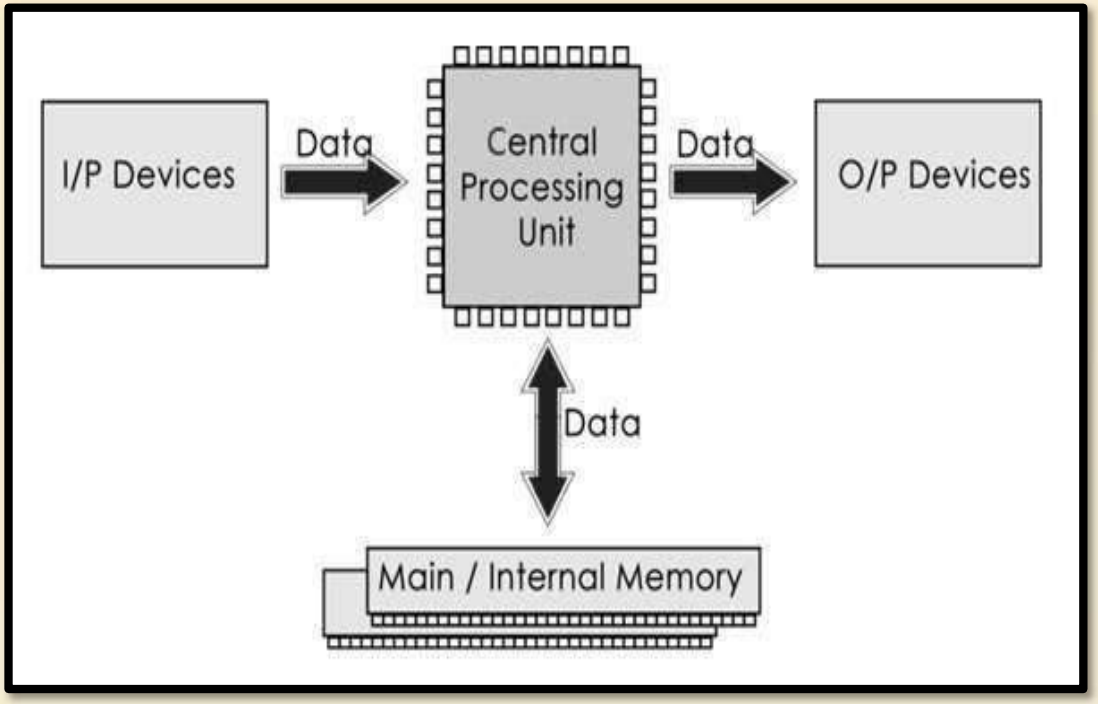
"A Computer is an electronic device that takes raw data (unprocessed) as an input from the user and processes it under the control of a set of instructions (called program), produces a result (output), and saves it for future use."

Block Diagram of Computer: How Data Flows



Components of Computer

The computer is the combination of hardware and software. Hardware is the physical component of a computer like motherboard, memory devices, monitor, keyboard etc., while software is the set of programs or instructions. Both hardware and software together make the computer system to function.

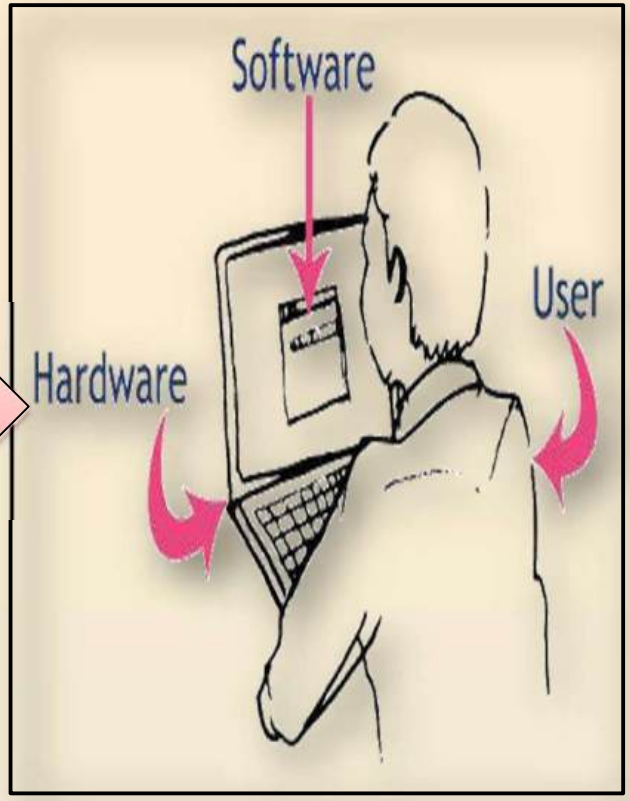


Components of Computer

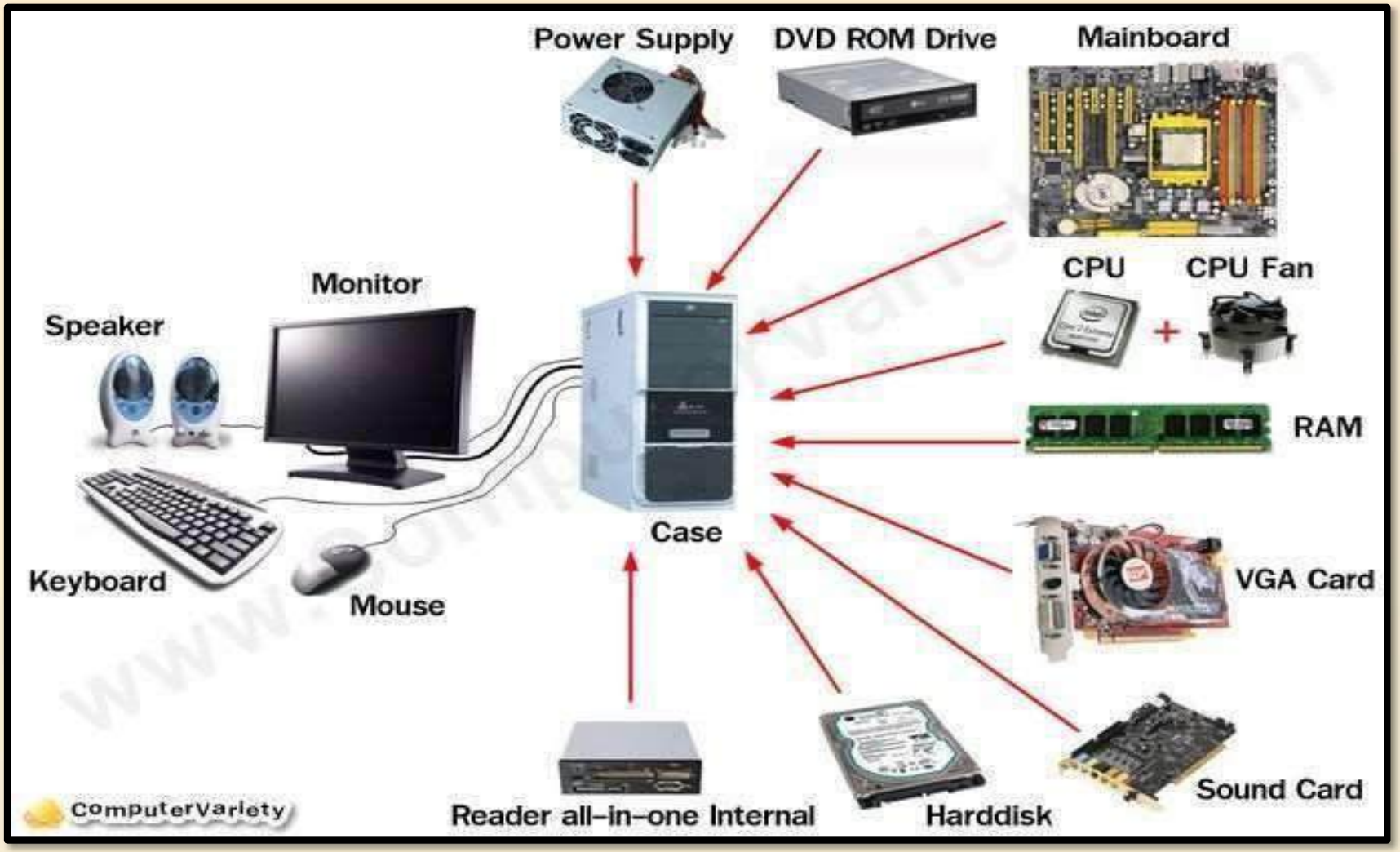
What does a computer consist of?

Although every computer mainly consists of two things hardware and soft ware but the user who access it also sometimes regarded as computer components so we can include its overall components are..

- Hardware
- Software
- User



Detailed View of Hardware Components



C.P.U (Central Processing Unit)

CPU is the major component which interprets and executes software Instructions. It also control the operation of all other components such as memory, input and output units. It accepts binary data as input, process the data according to the instructions and provide the result as output.

The CPU has three components which are Control unit, Arithmetic and logic unit (ALU) and Memory unit.

Arithmetic and Logic Unit: The ALU is a part of the CPU where various computing functions are performed on data. The ALU performs arithmetic operations such as addition, subtraction, multiplication, division and logical operations. The result of an operation is stored in internal memory of CPU.

Control Unit: The control unit controls the flow of data between the CPU, memory and I/O devices. It also controls the entire operation of a computer.

Memory Unit: To Store the result of all the processed data by ALU we need a temporary storage place that is called as memory unit of CPU. It has various registers that are limited in numbers to hold that data temporary for other process.

Central Processing Unit Types

Types of CPU

1. **Single-core CPU: i**t is the oldest type of CPU which is available and employed in most of the personal and official computers. ...

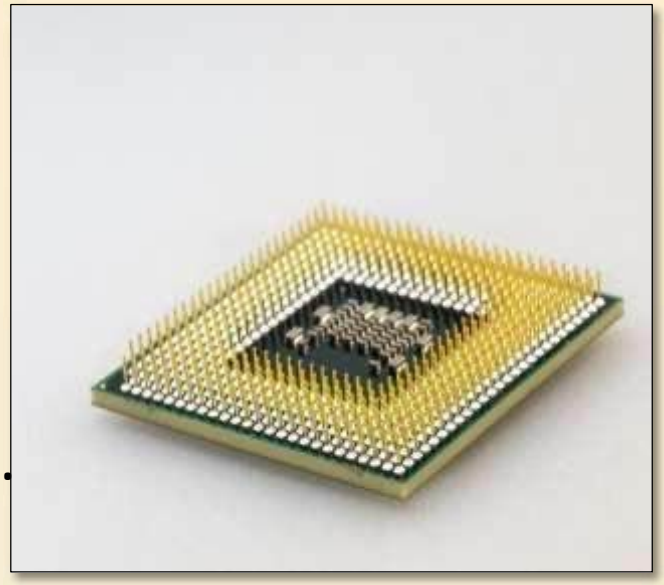
2. **Dual-core CPU.** It is a single CPU that comprises of two strong cores and functions like dual CPU acting like one. ...

3. **Quad-core CPU. ...**

4. **Hexa Core processors. ...**

5. **Octa-core processors. ...**

6. **Deca-core processor.**



Memory Devices (Primary and Secondary)

Hard Disk

RAM

ROM

CD/DVD

Floppy

Memory Card

Pen Drive

Tape

Memory Unit (Primary and Secondary)

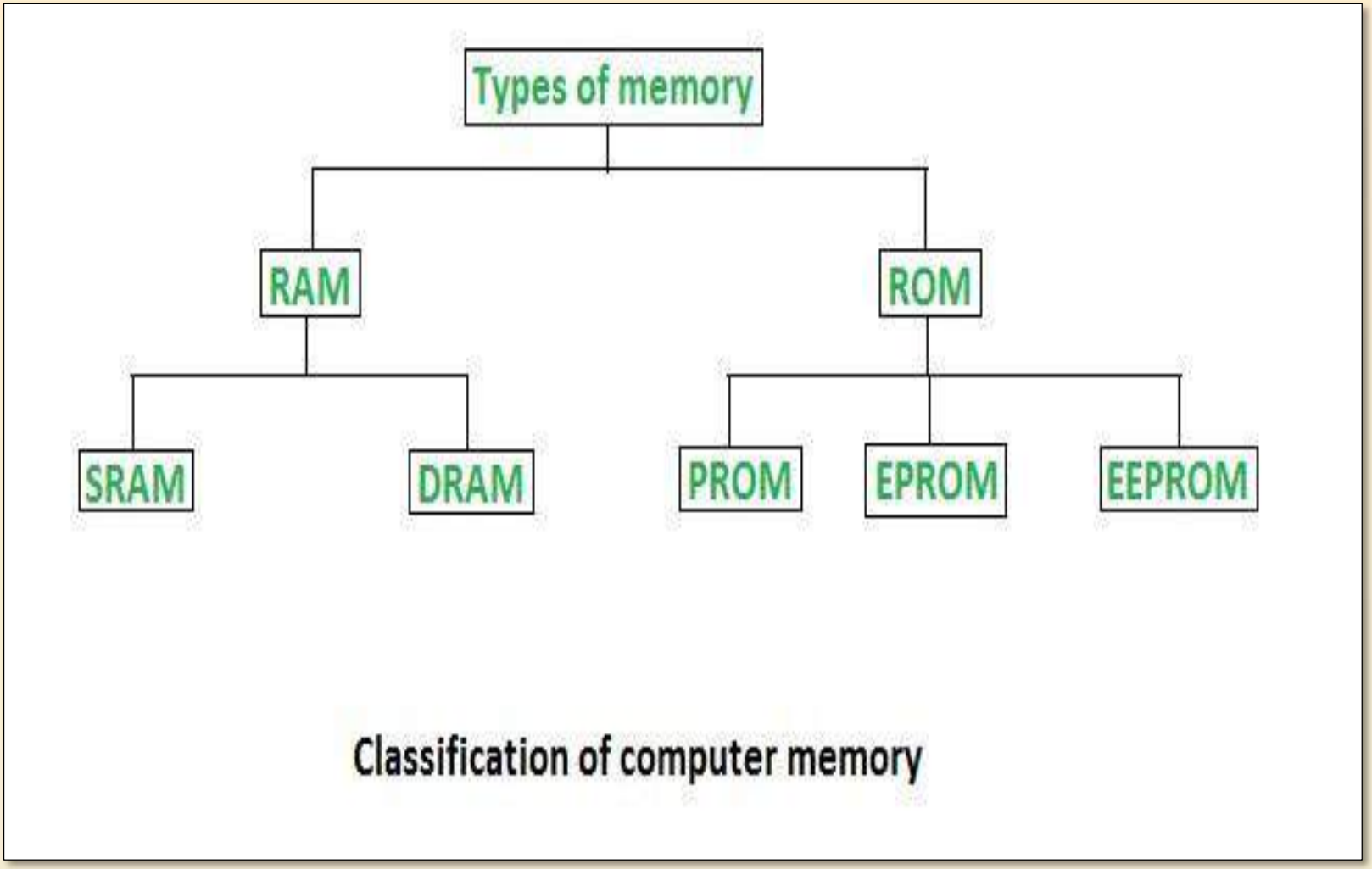
Memory is the most essential element of a computing system because without it computer can't perform simple tasks. The Memory Unit is of two types which are primary memory and secondary memory.

The primary memory is used to temporarily store the programs and data when the instructions are ready to execute. The secondary memory is used to store the data permanently.

The Primary Memory is volatile, that is, the content is lost when the power supply is switched off. The Random Access Memory (RAM) is an primary-volatile memory and Read Only Memory (ROM) is primary-non-volatile memory.

The Secondary memory is non volatile, that is the content is available even after the power supply is switched off. Hard disk, CD-ROM and DVD ROM are examples of secondary memory.

Classification of Primary Memory



Classification of computer memory

Random Access Memory (RAM): In Detail

It is also called as read write memory or the main memory or the primary memory. The programs and data that the CPU requires during execution of a program are stored in this memory. It is a volatile memory as the data loses when the power is turned off. RAM is further classified into two types-

SRAM (Static Random Access memory) and DRAM (Dynamic Random Access Memory).

DRAM	SRAM
1. Constructed of tiny capacitors that leak electricity.	1.Constructed of circuits similar to D flip-flops.
2.Requires a recharge every few milliseconds to maintain its data.	2.Holds its contents as long as power is available.
3.Inexpensive.	3.Expensive.
4. Slower than SRAM.	4. Faster than DRAM.
5. Can store many bits per chip.	5. Can not store many bits per chip.
6. Uses less power.	6.Uses more power.
7.Generates less heat.	7.Generates more heat.
8. Used for main memory.	8. Used for cache.

Read Only Memory (ROM) in Detail

Read Only Memory (ROM) –Stores crucial information essential to operate the system, like the program essential to boot the computer. It has following features:

1. It is not volatile.

2. Always retains its data.

3. Used in embedded systems or where the programming needs no change.

4. Used in calculators and peripheral devices.

5. ROM is further classified into 4 types- ROM, PROM, EPROM, and EEPROM.

Types of Read Only Memory (ROM) –

1. **PROM (Programmable read-only memory)** – It can be programmed by user. Once programmed, the data and instructions in it cannot be changed.

2. **EPROM (Erasable Programmable read only memory)** – It can be reprogrammed. To erase data from it, expose it to ultra violet light. To reprogram it, erase all the previous data.

3. **EEPROM (Electrically erasable programmable read only memory)** – The data can be erased by applying electric field, no need of ultra violet light. We can erase only portions of the chip.

Difference between RAM AND ROM

RAM	ROM
1. Temporary Storage.	1. Permanent storage.
2. Store data in MBs.	2. Store data in GBs.
3. Volatile.	3. Non-volatile.
4.Used in normal operations.	4. Used for startup process of computer.
5. Writing data is faster.	5. Writing data is slower.

Difference between RAM and ROM

Hard Disk Drive (HDD)

A hard disk drive (HDD), hard disk, hard drive, or fixed disk is an electro-mechanical data storage device that stores and retrieves digital data using magnetic storage and one or more rigid rapidly rotating platters coated with magnetic material.

It stores digital content, documents, pictures, music, videos, programs, application preferences, and operating system

Hard drives can be **external or internal.** A hard drive determines the size of digital files in terms of **megabytes (MB), gigabytes (GB), and terabytes (TB)**

Pen Drive

A pen drive, or a USB flash drive, is a portable data-storage device. Pen drives have replaced the floppy drives of old and have become the most popular data-storage devices among consumers.

Micro, lightweight and handy, a pen drive can be easily carried from place to place by students, professionals, academicians and independent tech consultants.

Currently available pen drives with storage capacities ranging from 8GB and 32GB can be used to store graphics-heavy documents, photos, music files and video clips.

INPUT DEVICES

Keyboard

Keyboard: Keyboard (wired / wireless, virtual) is the most common input device used today. **The individual keys for letters, numbers and special characters are collectively known as character keys**. keyboard layout is derived from the keyboard of original typewriter. The data and instructions are given as input to the computer by typing on the keyboard. Apart from alphabet and numeric keys, it also has Function keys for performing different functions. There are **different set of keys available in the keyboard such as character keys, modifier keys, system and GUI keys, enter and editing keys, function keys, navigation keys, numeric keypad and lock keys.**

Keyboard Keys

Sr. No.	Keys	Description
1	Typing Keys	These keys include the letter keys (A-Z) and digits keys (0-9) which are generally give same layout as that of typewriters.
2	Numeric Keypad	It is used to enter numeric data or cursor movement. Generally, it consists of a set of 17 keys that are laid out in the same configuration used by most adding machine and calculators.
3	Function Keys	The twelve functions keys are present on the keyboard. These are arranged in a row along the top of the keyboard.Each function key has unique meaning and is used for some specific purpose.
4	Control keys	These keys provides cursor and screen control. It includes four directional arrow key.Control keys also include Home, End,Insert, Delete, Page Up, Page Down, Control(Ctrl), Alternate(Alt), Escape(Esc).
5	Special Purpose Keys	Keyboard also contains some special purpose keys such as Enter, Shift, Caps Lock, Num Lock, Space bar, Tab, and Print Screen.

Keyboard's Key Description

Alphabet Keys

Alphabet keys have alphabets, from A to Z, written on them. By pressing these keys, you can type alphabets, words, sentences etc. in lower case. For example, when you press 'A' key, 'a' gets typed. To type the alphabet in upper case, you need to press Shift key along with the alphabet key. For example, if you press 'A' key along with Shift key, letter 'A' gets typed.

Number Keys

Number keys have digits, from 0 to 9, written on them. These keys are used for typing the numbers. Note that each number key also has a special character written just above the number. To type this character, you will have to press the number key along with the Shift key. For example, number 5 key has % sign marked on it. When you press number 5 key, 5 will get typed. If you pres the same key, along with Shift key % sign will get typed.

Special Character Keys

Few keys of the keyboard have special characters like semicolon (;), comma (,), dot (.) etc. marked on them. Such keys are called special character keys. When you press special character key, character marked on it gets typed at current cursor position.

Function Keys

There are 12 function keys present on the keyboard. They are named as F1, F2, F3 .....F12. When you press these keys they perform special functions.

Cursor Keys

Four cursor keys are there on the keyboard. They are marked with arrows on them, pointing in four different directions. Using cursor keys, you can move the cursor from one place to another.

1.1.1 Keyboard's Key Description

✓ **Action Keys:** Keyboard has many action keys. When you press an action key, a special event takes place. Most commonly used action keys of the keyboard are described below.

✓ **Caps Lock Key:** When you press this key, capital lock becomes on. When you press an alphabet key, while capital lock is on, the letter written on it gets typed in upper case.

✓ **Shift Key:** Shift key is always pressed along with other keys. When you press this key along with number key then the symbol written on upper part of the key gets typed. When you press Shift key along with alphabet key then the alphabet gets typed in upper case.

✓ **Enter Key:** Enter key is used to start a new line. When you press this key; cursor comes to the next line. Whatever you type now, gets typed in the next line.

✓ **Space Bar** : This key is used to put blank spaces between the two characters.

✓ **DEL Key**: This key is used to rub a character from current cursor position.

✓ **Backspace Key:** This key removes one character from the left side of the cursor.

✓ **Insert Key:** This key is used to insert characters in between the two characters, which have already been typed.

✓ **Page Keys:** There are two page keys on the keyboard, named as PgDn (i.e. Page Down) and PgUp (i.e. Page Up). When you press PgUp key, previous page gets displayed on the screen. When you press PgDn key, next page gets displayed on the screen.

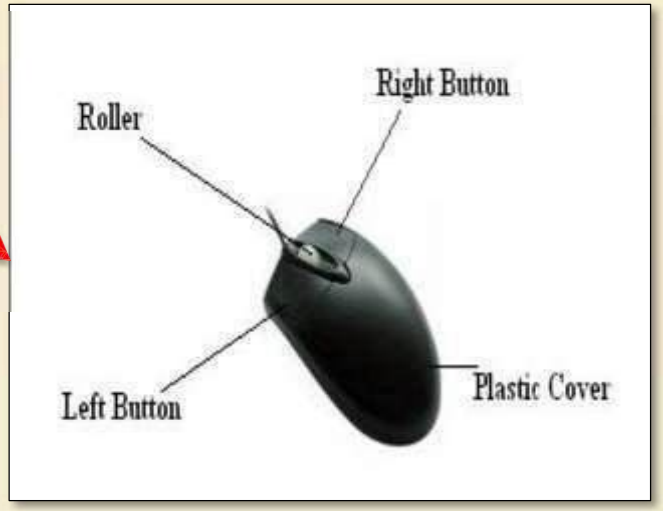
✓ **Tab Key:** This key is used for making the cursor jump in forward direction, by many places.

✓ **ESC Key:** This key is called Escape key. Currently on-going activity gets cancelled when this key is pressed.

MOUSE

Mouse: Mouse (wired/wireless) is a pointing device used to control the movement of the cursor on the display screen. It can be used to select icons, menus, command buttons or activate something on a computer. Some mouse actions are move, click, double click, right click, drag and drop.

Different types of mouse available are: Mechanical Mouse, Optical, Laser Mouse, Air Mouse, 3D Mouse, Tactile Mouse, Ergonomic Mouse and Gaming Mouse



Scanners

Scanner: A Scanner **is an input device and is used to input data into the computer system in the form of pictures.** It optically scans images, printed text, handwriting, or an object, and converts it to a digital image. Examples of scanners **are a desktop or flatbed scanner.**

This **device works like a Xerox machine. The scanner any converts type of printed or written information including** photographs into a digital format, which can be manipulated by the computer.

Figure 1.5 Scanner

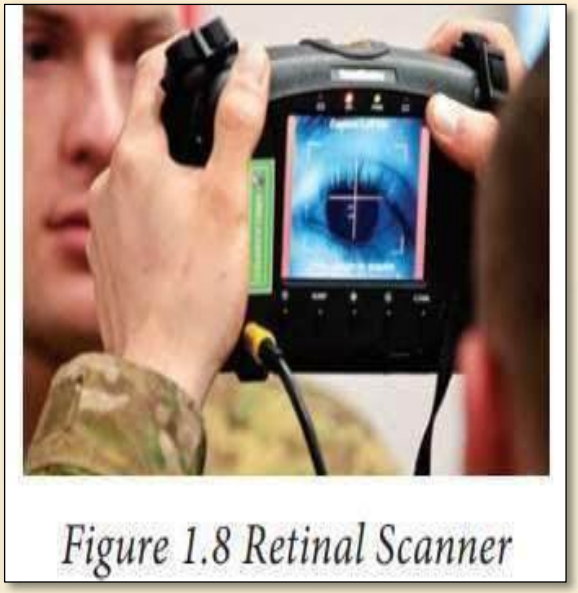


Figure 1.8 Retinal Scanner

Figure 1.6 Fingerprint Scanner

Bar Code reader

Bar Code / QR Code Reader: A Bar code is a pattern printed in lines of different thickness. The **Bar code reader scans the information on the bar codes transmits to the Computer for further processing**. The **bar code is 13 digits long and it has four main divisions**.

The **First two digits of a bar code represent the country, the second part represents the manufacturer's code (five digits) the third part represents the product code (five digits) and the last digit is a check digit.**The system gives fast and error free entry of information into the computer.

QR (Quick response) Code: The **QR code is the two dimension bar code which can be read by a camera and processed to interpret the image.**

Web Camera

A **webcam** is input device that is like a video camera that feeds or streams an image or video in real time to or through a computer to a computer network, such as the Internet. Webcams are typically small cameras that sit on a desk, attach to a user's monitor, or are built into the hardware. Webcams can be used during a video chat session involving two or more people, with conversations that include live audio and video.

Webcams typically include a lens, an image sensor, support electronics, and may also include one or even two microphones for sound.

Typical low-cost webcam used with many personal computers (2007)

OUTPUT DEVICES

DISPLAY Unit

Display: it is also called Monitor that is the most commonly used output device to display the information. It looks like a TV. Pictures on a monitor are formed with picture elements called PIXELS.

Monitors may either be Monochrome which display text or images in Black and White or can be color, which display results in multiple colors.

There are many types of monitors available such as CRT (Cathode Ray Tube), LCD (Liquid Crystal Display) and LED (Light Emitting Diodes). The monitor works with the VGA (Video Graphics Array) card.

1.1.1 DISPLAY Unit

Monitors

Monitor commonly called as Visual Display Unit (VDU) is the main output device of a computer. It forms images from tiny dots, called pixels, that are arranged in a rectangular form. The sharpness of the image depends upon the no. of the pixels.

There are two kinds of viewing screen used for monitors.

- Cathode-Ray Tube (CRT)
- Flat- Panel Display

Cathode-Ray Tube (CRT) Monitor

In the CRT display is made up of small picture elements called pixels for short.The smaller the pixels, the better the image clarity, or resolution.It takes more than one illuminated pixel to form whole character, such as the letter e in the word help.

A finite number of character can be displayed on a screen at once.The screen can be divided into a series of character boxes - fixed location on the screen where a standard character can be placed.

The most screens are capable of displaying 80 characters of data horizontally and 25 lines vertically. There are some disadvantage of CRT

- Large in Size

1.1.1 DISPLAY Unit

Flat-Panel Display Monitor

The flat-panel display refers to a class of video devices that have reduced volume, weight and power requirement compare to the CRT. You can hang them on walls or wear them on your wrists. Current uses for flat-panel displays include calculators, videogames, monitors, laptop computer, graphics display.

The flat-panel display are divided into two categories

- **Emissive Displays** - The emissive displays are devices that convert electrical energy into light. Example are plasma panel and LED(Light-Emitting Diodes).
- **Non-Emissive Displays** - The Non-emissive displays use optical effects to convert sunlight or light from some other source into graphics patterns.Example is LCD(Liquid-Crystal Device)

Printers

Printers: Printers are used to print the information on papers. Printers are divided into two main categories:

- **Impact Printers**
- **Non Impact printers**

Impact Printers : these printers print with striking of hammers or pins on ribbon. These printers can print on multi-part **(using carbon papers) by using mechanical pressure. For example, Dot Matrix printers and Line matrix printers are impact printers**.

A **Dot matrix printer** that prints using a fixed number of pins or wires. Each dot is produced by a tiny metal rod, which works by the power of a tiny electromagnet or solenoid, either directly or through a set of small levers. It generally prints one line of text at a time. The printing speed of these printers varies from 30 to 1550 CPS (Character Per Second).

Printers

Line matrix printers use a fixed print head for printing. **Basically, it prints a page-wide line of dots. But it builds up a line of text by printing lines of dots.** These printers are capable of printing much more than 1000 Lines Per Minute, that result in thousands of pages per hour. **These printers also uses mechanical pressure to print on multi-part (using carbon papers**).

Printers

Non-Impact Printers These printers do not use striking mechanism for printing. They use electrostatic or laser technology. Quality and speed of these printers are better than Impact printers. For example, **Laser printers and Inkjet printers are non-impact printers.**

Laser Printers: Laser printers mostly work with similar technology used by photocopiers. It makes a laser beam scan **back and forth** across a drum inside the printer, building up a pattern. **It can produce very good quality of graphic images**. One of the chief characteristics of laser printer is their resolution – how many **Dots per inch(DPI).** The available resolution range around 1200 dpi. Approximately it can print 100 pages per **minute(PPM)** .

Figure 1.19 Laser Printer

1.1.3 Printers

Inkjet Printers: Inkjet Printers use **color cartridges which combined Magenta, Yellow and Cyan inks to create color tones**. A black cartridge is also used for monochrome output. Inkjet printers work by spraying ionized ink at a sheet of paper. The speed of Inkjet printers generaly range from **1-20 PPM (Page Per Minute).**

Figure 1.20 Inkjet Printer

They use the technology of **firing ink by heating it so that it explodes towards the paper in bubbles or by using piezoelectricity in which tiny electric currents** controlled by electronic circuits are used inside the printer to spread ink in jet speed. An Inkjet printer can spread millions of dots of ink at the paper every single second

Peripheral Devices

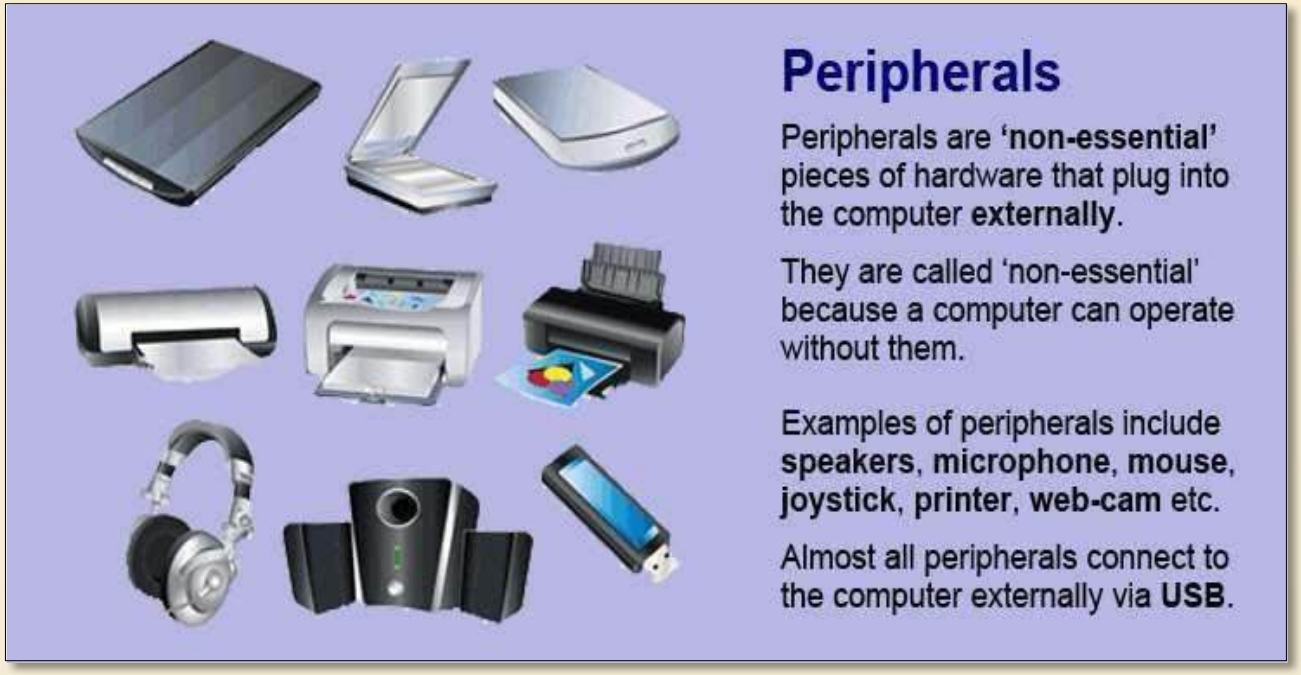
A peripheral device, also sometimes called an auxiliary device, is any connected device (internal or external) that provides a computer with additional functionality.

Peripheral devices fall into three main categories:

1. Input devices, which send data to the computer.

2. Output devices, which receive data from the computer.

3. Input/output devices, such as storage devices



Motherboard

Motherboard

The motherboard serves as a single platform to connect all of the parts of a computer together. A motherboard connects CPU, memory, hard drives, optical drives, video card, sound card and other ports and expansion cards directly or via cables. It can be considered as the backbone of a computer.

Motherboard varies greatly in supporting various types of components.

Normally a motherboard supports a single type of CPU and few types of memories.

Video Cards, Hard disks, Sound Cards have to compatible with motherboard to function properly.

Motherboards, cases and power supplies must be compatible to work properly together .

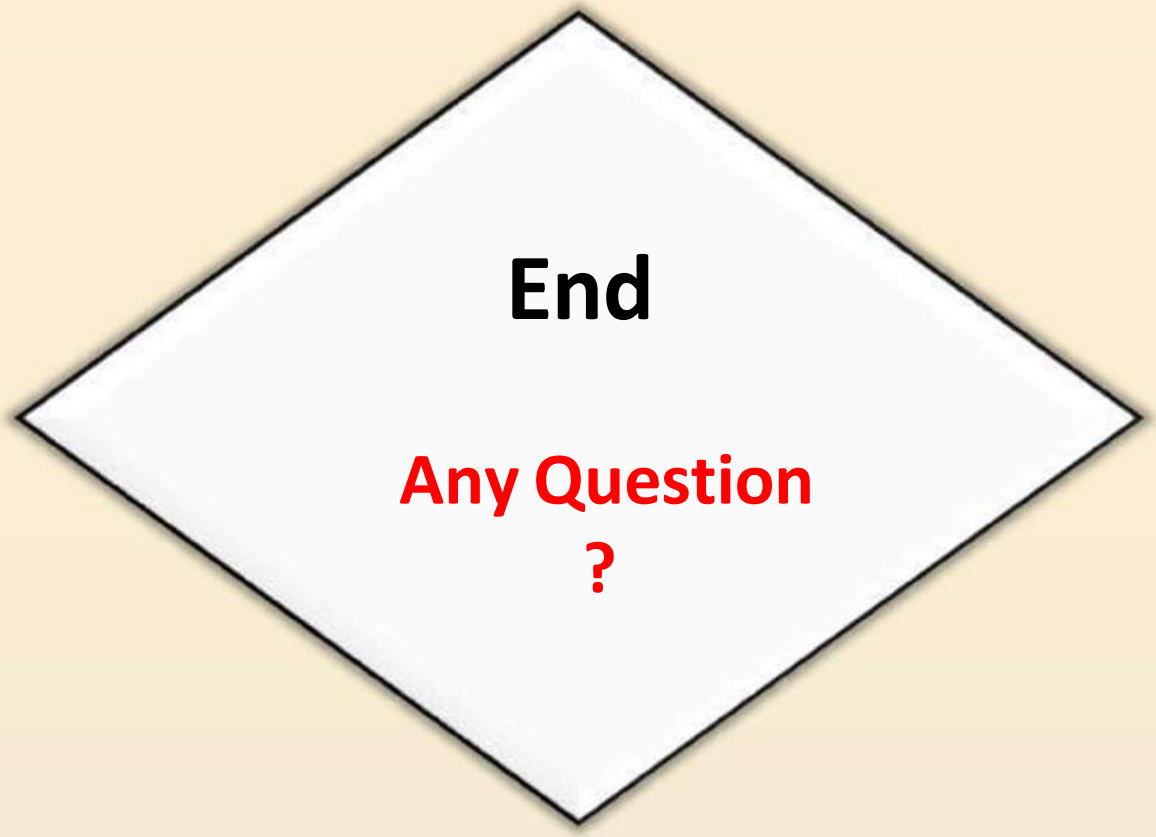
Mother board description

The motherboard is mounted inside the case and is securely attached via small screws through pre-drilled holes that contains ports to connect all of the internal components. It provides a single socket for CPU.

For memory, normally one or more slots are available. It provide ports to attach floppy drive, hard drive and optical drives via ribbon cables. Mother board carries fans and a special port designed for power supply.

On left side, motherboards carries a number of ports. These ports connect monitor, printer, mouse, keyboard, speaker, network cables and all to the motherboard.

Motherboards also provide USB ports which allows compatible devices to be connected in plug-in/plug-out fashion. For example, pen drive, digital cameras etc.


End
Any Question
?

INTRODUCTION TO IT SYSTEMS
Subject Code- 2002203

UNIT-1 LECTURE -2
COMPUTER LANGUAGES

Syllabus

Course Content:-

UNIT 1: Basic Internet skills: Understanding browser, efficient use of search engines, awareness about Digital India portals (state and national portals) and college portals.
General understanding of various computer hardware components – CPU, Memory, Display, Keyboard, Mouse, HDD and other Peripheral Devices.

UNIT 2: OS Installation (Linux and MS Windows), Unix Shell and Commands, vi editor.

UNIT 3: HTML4, CSS, making basic personal webpage.

UNIT 4: Office Tools: Open Office Writer, Open Office Spreadsheet (Calc), Open Office Impress.

UNIT 5: Information security best practices. Class lectures will only introduce the topic or demonstrate the tool, actual learning will take place in the Lab by practicing regularly.

Contents of UNIT:

1. BASIC COMPUTER & INTERNET SKILLS

1.1 General understanding of various computer components: Block Diagram of Computer

1.1.1 CPU, Memory, Display, Keyboard, Mouse

1.1.2 HDD and Pen Drive

1.1.3Peripheral Devices (Printers, Scanners, Web camera & Barcode Reader)

1.2 Computer Languages: Machine, Assembly & High-level Language

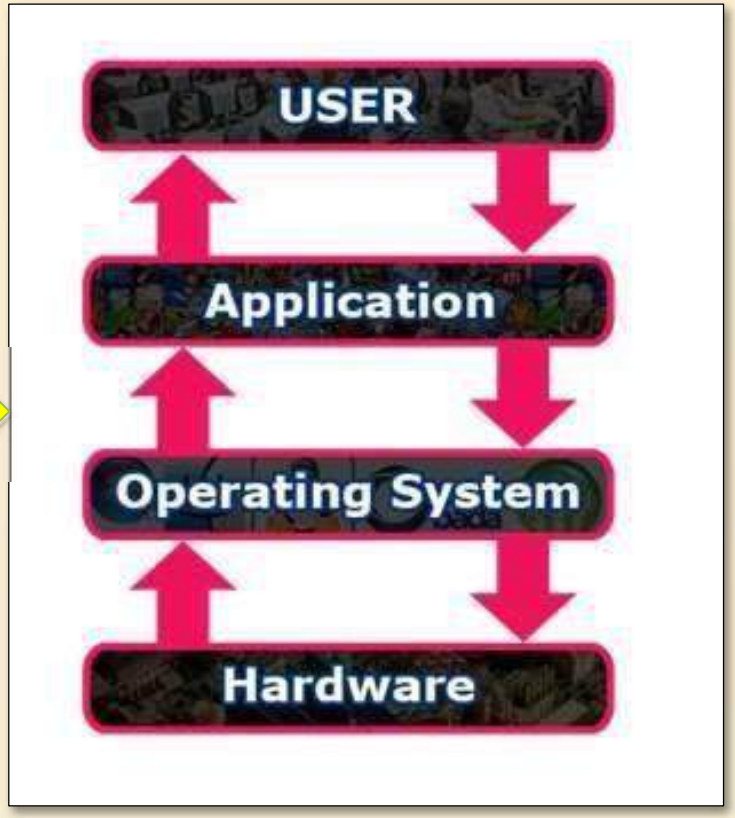
1.3 Computer & Communication: Meaning of Web Address, URL, IP address, E-mail

1.4Awareness about Digital India portals (state and national portals) and college portals.

How does Computer work?

From Definition we know that computer is an electronic device that processes the input according to the set of instructions provided to it and gives the desired output at a very fast rate.

- **When a user wants to communicate with the computer, the user interacts with an application. The application interacts with the operating system, and the operating system makes hardware components to work according to the user given instructions.**
- **The hardware components send the result back to the operating system, then the operating system forwards the same to the application and the application shows the result to the user.**
- **By using input devices, the user interacts with the application and the application uses output devices to show the result.**
- **All input and output devices work according to the instructions given by the operating system.**



Computer Languages

In order to understand all the functionality of the computer we need to understand firstly how computer work or communicate with user?

Generally it performs all the command that it accept by the user but the process of working and understanding the command for computer is very much different from human.

Human communicates with each other by the means of some language and that language also should be well known and understood by other person then only our communication takes place else it fails.

Computer Languages

What is Computer Language?

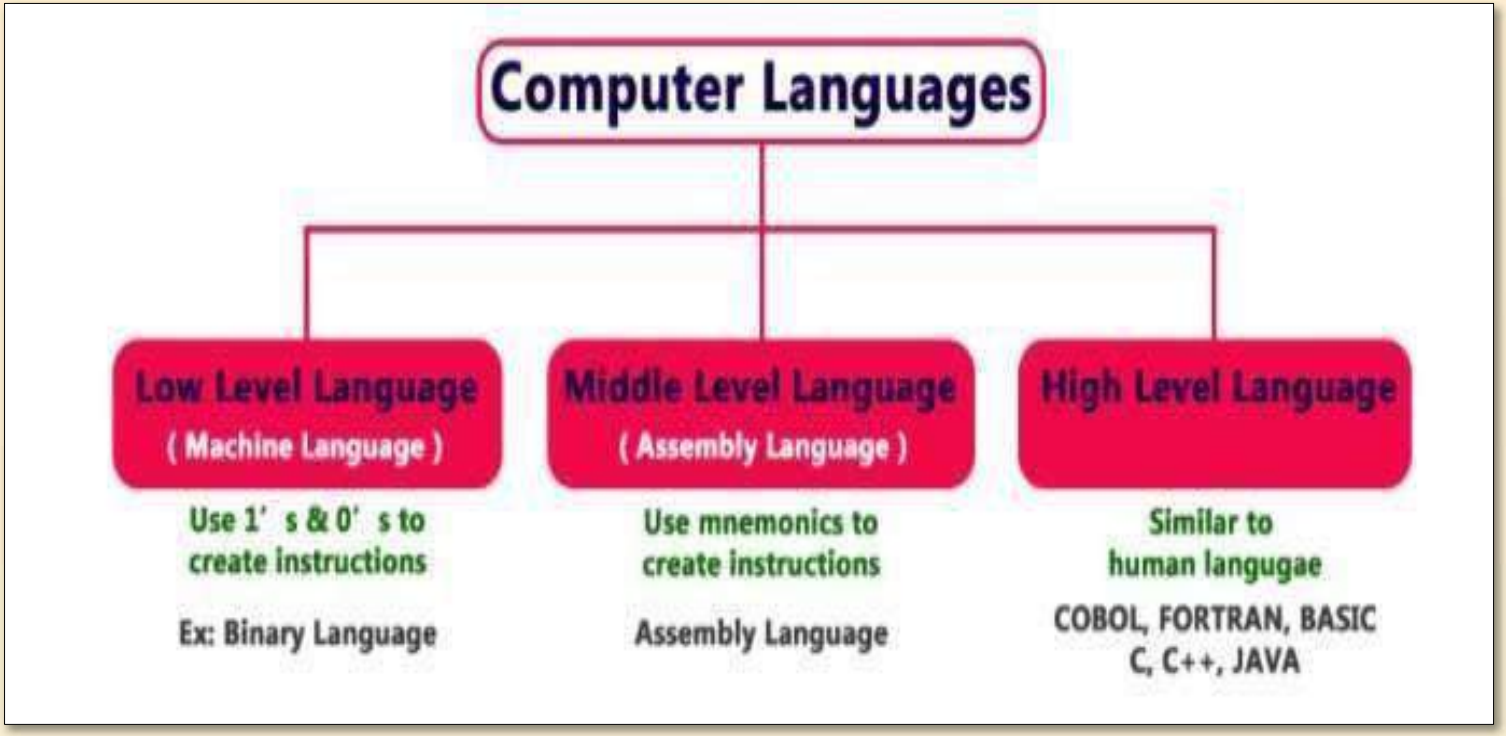
Generally, we use languages like English, Hindi, etc., to make communication between two persons. That means when we want to make communication between two persons we need a language through which persons can express their feelings.

Similarly, when we want to make communication between user and computer or between two or more computers we need a language through which user can give information to the computer and vice versa.

When a user wants to give any instruction to the computer the user needs a specific language and that language is known as a computer language. The user interacts with the computer using programs and that programs are created using computer programming languages like C, C++, Java, etc.,

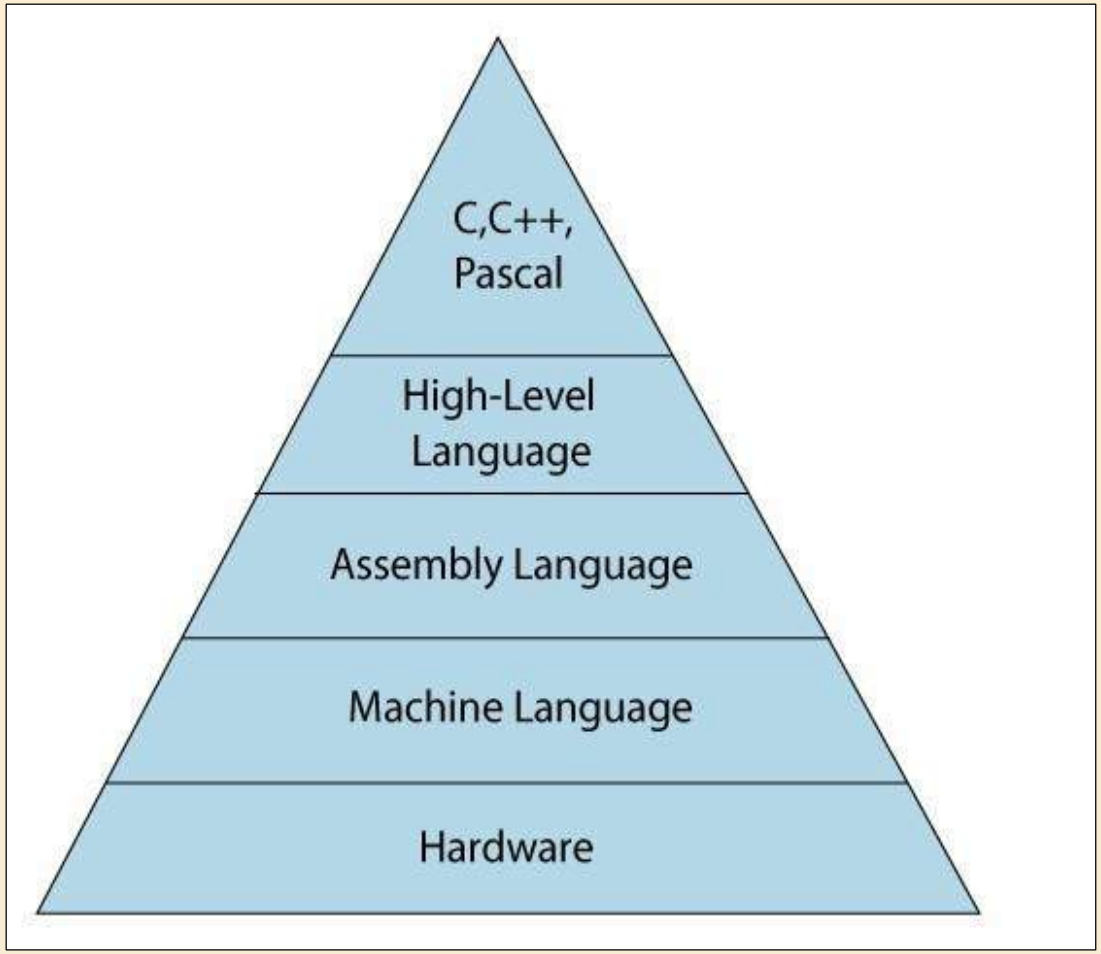
In short we can say that Computer languages are the languages through which the user can communicate with the computer by writing program instructions. Every computer programming language contains a set of predefined words and a set of rules (syntax) that are used to create instructions of a program.

Computer Languages classification



Over the years, computer languages have been evolved from Low-Level to middle level to now High-Level Languages. In the earliest days of computers, only Binary Language was used to write programs.

1.2 Computer Languages classification



Top to bottom view: How instruction are translated in different computer languages format to communicate with hardware .

High level language

What is High-Level computer Language?

- **The high-level language is a programming language that can be understood by the users and thus allows a programmer to write the programs which are independent of particular type of computer and they are closer to human languages than machine-level language.**

- **When writing a program in a high-level language, then the whole attention needs to be paid to the logic of the problem not the process.**

- **As we know computer only understand low or machine level language, so we need to translate or convert this high level language to low or machine level language for this a system software called compiler is required to translate a high-level language into a low-level language. We use Compiler or interpreter to convert high-level language to low-level language.**

- **Languages like COBOL, FORTRAN, BASIC, C, C++, JAVA, etc., are examples of high-level languages.**

High level language Continue…

Advantages of a high-level language:

✓ **The programming languages like C, C++, Java, etc., are written in High-level language which is more comfortable for the developers.**

✓ **A high-level language is closer to the users, so it is easy to read, write, and maintain as it is written in English like words.**

✓ **The high-level languages are designed to overcome the limitation of low-level language, i.e., portability.**

✓ **The high-level language is portable; i.e., these languages are machine-independent.**

Disadvantages of a high-level language:

✓ **High-level language needs to be translated into low-level language.**

✓ **High-level language executes slower compared to middle and low-level languages**

Assembly level language

What is Assembly Level computer Language?

- **Assembly language is the more than low level and less than high-level language so it is intermediary language and so also called middle level language. it uses numbers, symbols, and abbreviations instead of 0s and 1s. For example: For addition, subtraction and multiplications it uses symbols likes Add, sub and Mul, etc.**

- **Middle-level language is a computer language in which the instructions are created using symbols such as letters, digits and special characters. Assembly language is an example of middle-level language. In assembly language, we use predefined words called mnemonics.**

- **But, computer cannot understand mnemonics, so we use a translator called Assembler to translate mnemonics into binary language.**

- **Assembler is a translator which takes assembly code as input and produces machine code as output. Computer cannot understand middle-level language, so it needs to be translated into a low-level language to make it understandable by the computer. So, Assembler is used to translate middle-level language into low-level language.**

Assembly level language Continue…

Advantages of a Assembly level language:

- **Writing instructions in a middle-level language is easier than writing instructions in a low-level language.**
- **Middle-level language is more readable compared to low-level language.**
- **Easy to understand, find errors and modify.**

Disadvantages of a Assembly level language:

- ✓ **Middle-level language is specific to a particular machine architecture, that means it is machine-dependent.**
- ✓ **Middle-level language needs to be translated into low-level language.**
- ✓ **Middle-level language executes slower compared to low-level language.**

Low level language

What is Low Level computer Language?

- **Machine language or low level programming language it that language that is completely understandable by the computer.**

- **Computer can understand any thing in two bits either 0 or 1 so, machine language can only be represented by 0s and 1s. For example: To write 12 in the computer system its representation is 1100. So it is very difficult to learn. To overcome this problem the assembly language is invented.**

- **Binary Language is an example of a low-level language. The binary language contains only two symbols 1 & 0. All the instructions of binary language are written in the form of binary numbers 1's & 0's. A computer can directly understand the binary language.**

- **Machine language is also known as the Machine Code. CPU directly understands the binary language instructions, it does not require any translator. CPU directly starts executing the binary language instructions and takes very less time to execute the instructions as it does not require any translation. Low-level language is considered as the First Generation Language (1GL).**

Low level language Continues..

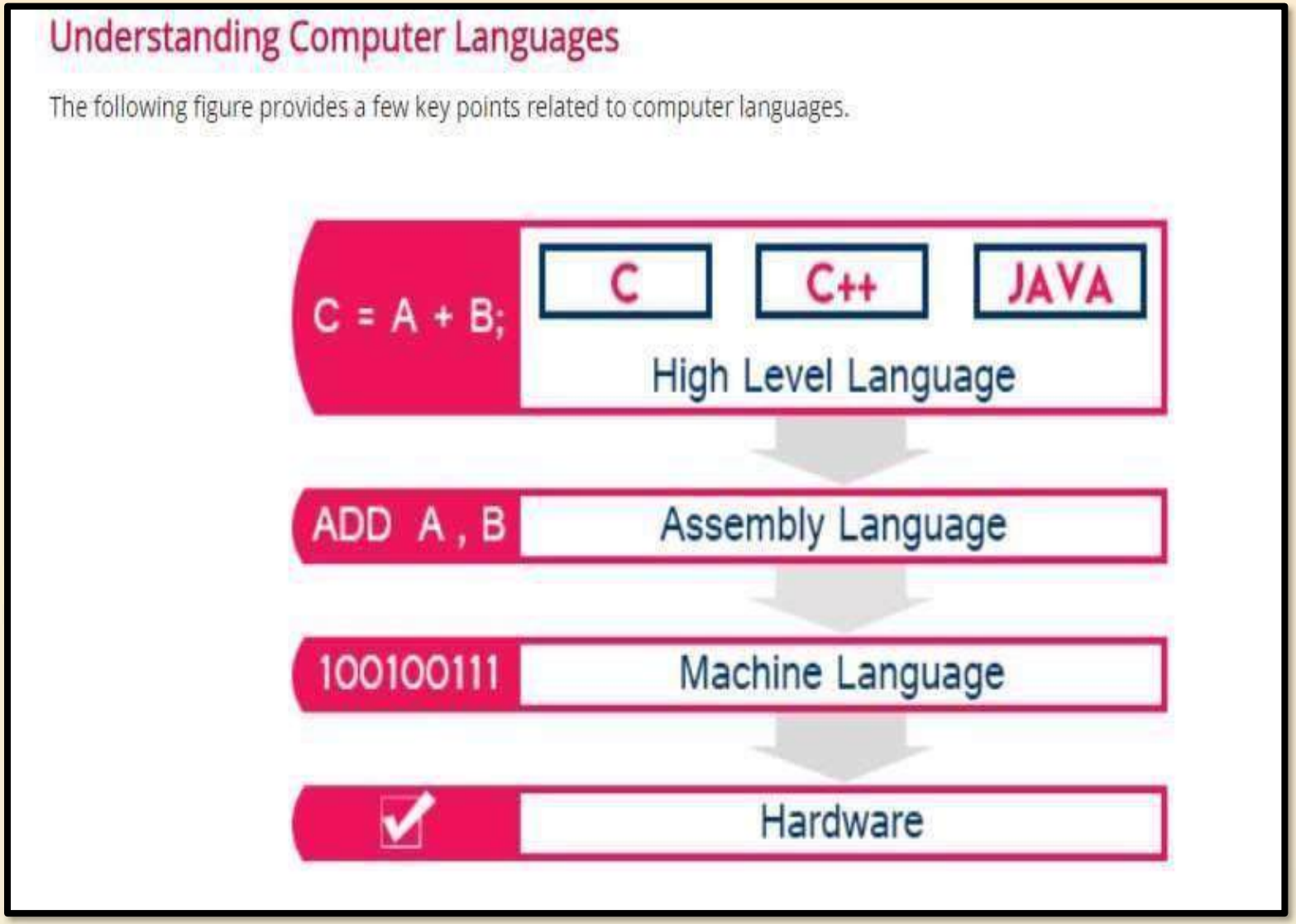
Advantages of a low level language:

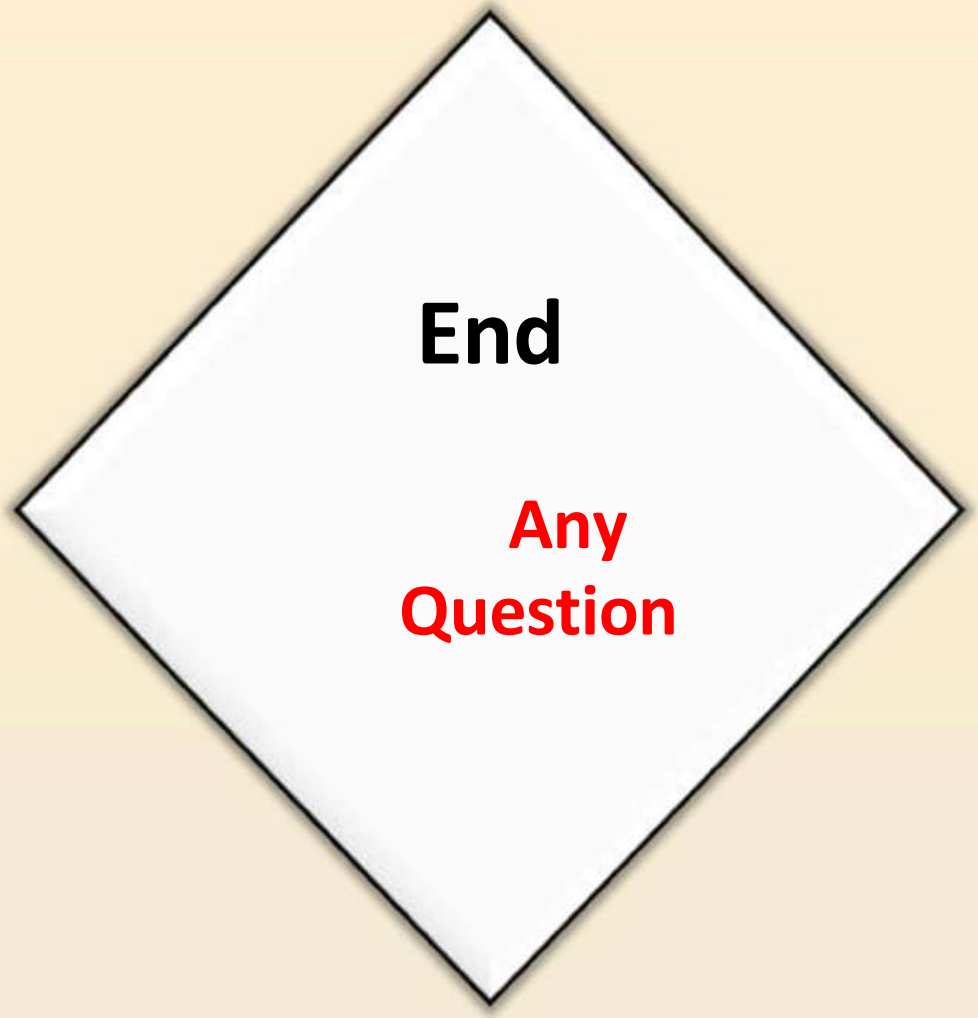
- ✓ **A computer can easily understand the low-level language.**
- ✓ **Low-level language instructions are executed directly without any translation.**
- ✓ **Low-level language instructions require very less time for their execution.**

Disadvantages of a low level language:

- ✓ **Low-level language instructions are very difficult to use and understand.**
- ✓ **Low-level language instructions are machine-dependent, that means a program written for a particular machine does not execute on another machine.**
- ✓ **In low-level language, there is more chance for errors and it is very difficult to find errors, debug and modify.**

How each level of language work together?




End
Any
Question
?

INTRODUCTION TO IT SYSTEMS
Subject Code- 2002203

UNIT-1 LECTURE-3
Basic Internet Skill, Computer and Communication

Syllabus

Course Content:-

UNIT 1: Basic Internet skills: Understanding browser, efficient use of search engines, awareness about Digital India portals (state and national portals) and college portals.
General understanding of various computer hardware components – CPU, Memory, Display, Keyboard, Mouse, HDD and other Peripheral Devices.

UNIT 2: OS Installation (Linux and MS Windows), Unix Shell and Commands, vi editor.

UNIT 3: HTML4, CSS, making basic personal webpage.

UNIT 4: Office Tools: Open Office Writer, Open Office Spreadsheet (Calc), Open Office Impress.

UNIT 5: Information security best practices. Class lectures will only introduce the topic or demonstrate the tool, actual learning will take place in the Lab by practicing regularly.

Contents of UNIT: 1

1. BASIC COMPUTER & INTERNET SKILLS

1.1 General understanding of various computer components: Block Diagram of Computer

1.1.1 CPU, Memory, Display, Keyboard, Mouse

1.1.2 HDD and Pen Drive

1.1.3Peripheral Devices (Printers, Scanners, Web camera & Barcode Reader)

1.2 Computer Languages: Machine, Assembly & High-level Language

1.3 Computer & Communication: Meaning of Web Address, URL, IP address, E-mail

1.4 Awareness about Digital India portals (state and national portals) and college portals.

1.3 Computer and Communication

Why the need arise to connect two computer ?

Computers hold and process information. Users of the information naturally form groups and unless all the users of the group use the same computer there will be a need to connect their computers together. Different groups wants to connect different sets of computers together and so the need evolves into the requirement to form computers into networks such that any computer in the network can communicate with any other. This is why and how gradually internet evolved.

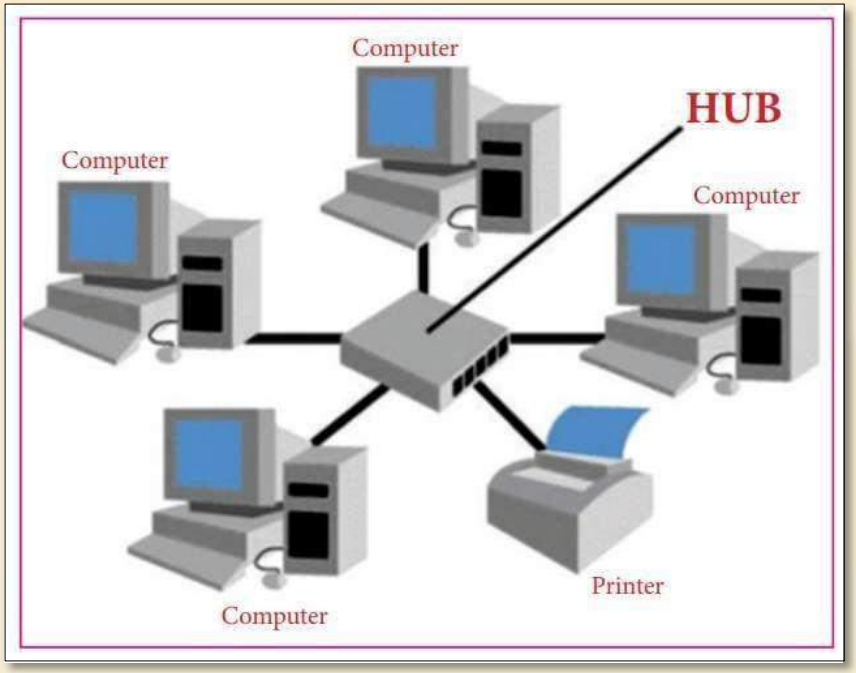
For following reasons we need to connect two computer:

- **File Transfer**: the ability to move a file from one computer to another. Transferring text files between machines is straight forward although it may be necessary to select a translation option to ensure the end of line character is treated properly.
- **File Access:** the ability to read or write a file on another computer. For example this allows a group of workstations to be connected together but to attach all the disks to just one member which would then provide the file store for the rest of the group.
- **Mail**: This is a natural extension to the service provided to a group of users on a single computer to a group of users on a network of computers.
- **Remote Login**: i.e. connecting a user's terminal or workstation to a remote computer so that the user can use that computer as if it were his local one.

Communication

Computer Network:

A computer network is an interconnection of various computers to share software, hardware, resources and data through a communication medium between them. The computers on a computer network may be linked through cables, telephone lines, radio waves, satellites, or infrared light beams.



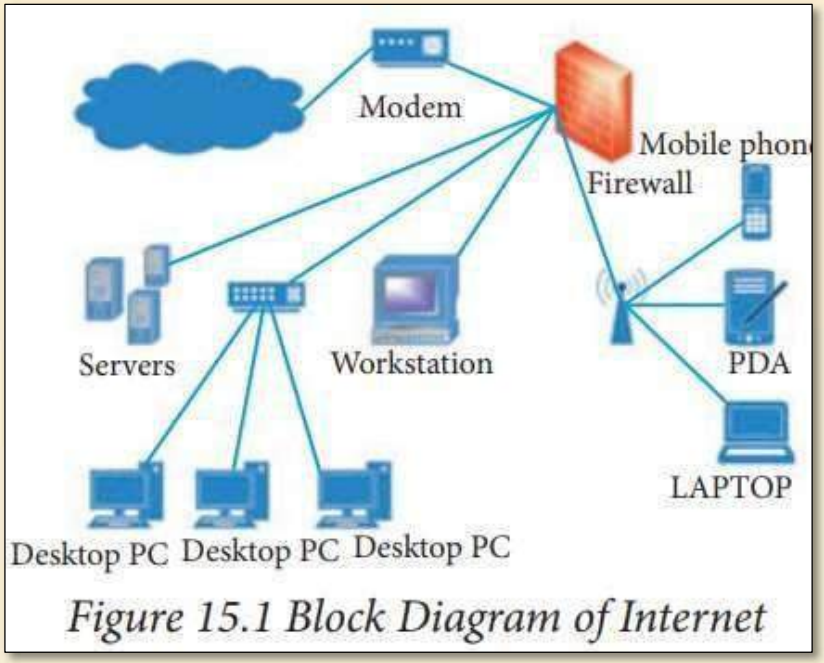


Figure 15.1 Block Diagram of Internet

Network and internet

Evolution of

1. ARPANET:

ARPANET was established by the Advanced Research Projects Agency (ARPA) in **1969 for two main reasons:**

1. To allow the transfer of data between various institutes of research

2. To answer the call of the U.S. Department of Defence for a technology to provide messaging capabilities to the government in the event of nuclear war.

Network and internet

Evolution of Networking

2. World Wide Web(WWW)

The World-Wide Web is a collection of documents and services. It is distributed across the Internet and linked together by hypertext links.

The web is therefore a subset of the Internet. **World Wide Web** was created by **Timothy Berners Lee in 1989** at CERN in Geneva.

Web page is a **document available on World Wide Web. A web page can contain information including text, graphics, audio, video and hyper** links. These hyper links are the link to other web pages.

Network and Internet

Evolution of Networking

3. Internet

Internet is a world-wide global system of interconnected computer networks.

- Internet uses the standard Internet Protocol (TCP/IP) and Every computer in internet is identified by a unique IP address.

- **IP Address is a unique set of numbers (such as 110.22.33.114) which identifies a computer location.**

- A special **computer DNS (Domain Name Server) is used to give name to the IP Address so that user can locate a computer by a name**.

- Internet is accessible to every user all over the world.

Evolution of Network and internet

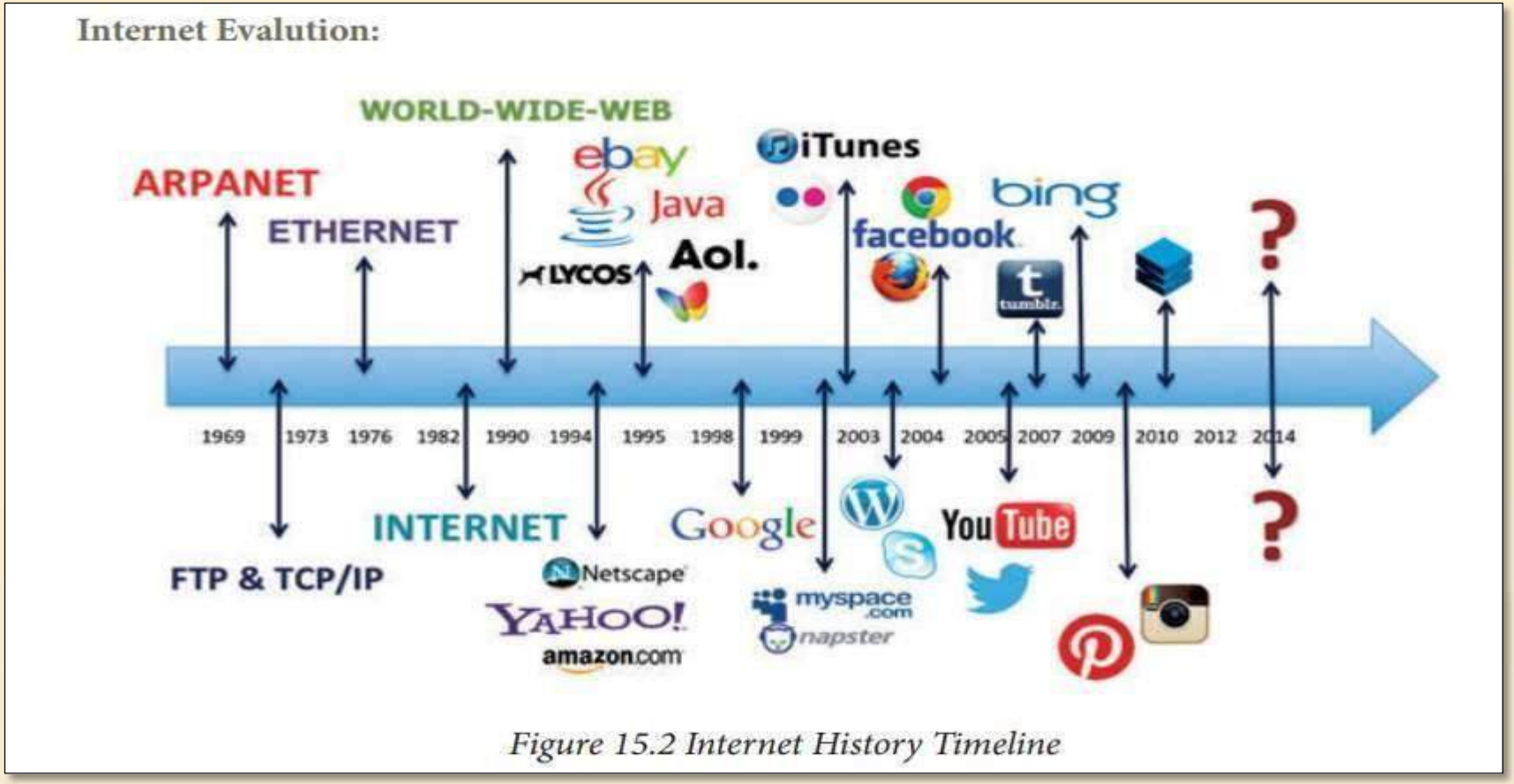


Figure 15.2 Internet History Timeline

- The History of the Internet Began with the launch of the Evolution of Research Network (ERNET) in 1986.
- The first publicly available Internet Service in India was launched by state -owned videsh Sanchar Nigam Limited (VSNL) on 14thAugust 1995

Internet Uses in Current time

Internet allows us to communicate with the people sitting at remote locations. There are various apps available on the web that uses Internet as a medium for communication.

One can find various social networking sites such as:

Facebook
Twitter
Instagram
Gmail
Whatsapp etc.

One can surf for any kind of information over the internet with the help of a search engine.

Apart from communication and source of information, internet also serves a medium for entertainment.

Online Television
Online Games
Songs
Videos
Social Networking Apps

Internet allows us to use many services like:

Internet Banking
Online Educational Services
Online Shopping
Online Ticket Booking
Online Bill Payment
Data Sharing
E-mail

Basic Tools of Internet

In order to access the various services of internet we need to have two main components and these are called basic tools for accessing internet.

1. **Hardware components**
2. **Software components**

Hardware Requirement :

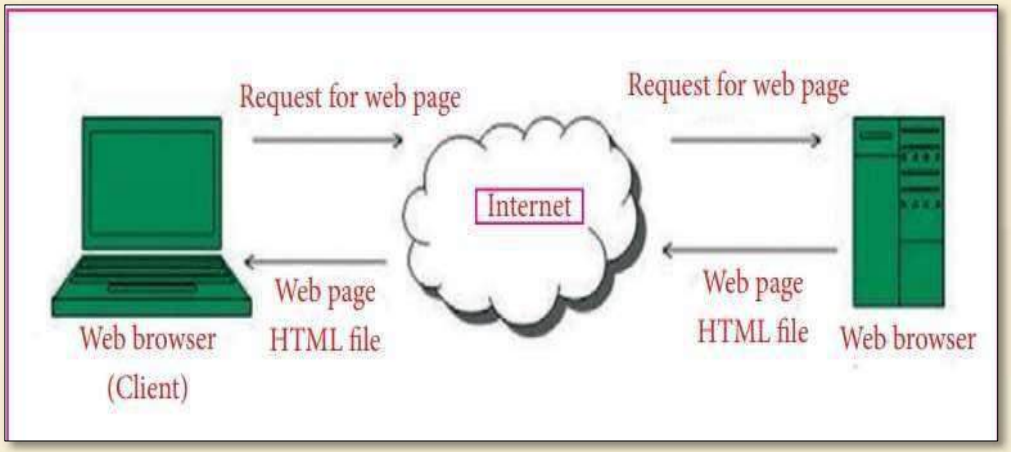
- To connect the Internet, any one of the following is mandatory.
- Modem is used to connect Internet thorugh Telephone connection.
- NIC- Network Interface Card(wired/ wireless) facility is the most important hardware required to connect Internet. For example, the Laptop can be connected Internet through the wired/wireless.
- Dongle is used to connect the Internet using cellular network
- Wi-Fi router or Hotspot is used to connect the Internet using wireless network
- Electronic device which supports cellular network
- Internet Connectivity such as Dial-up connection, ISDN, DSL, Cable TV, wired and wireless (Cellular) Network.

Software Requirement

- The operating system should support TCP (Transfer Control Protocol) / IP (Internet Protocol), SMTP (Simple Mail Transfer Protocol), FTP (File Transfer Protocol), HTTP (Hyper Text Transfer Protocol) and HTTPS (Hyper Text Transfer Protocol Secured) protocols.
- Browsers and other Internet clients access to the web applications such as Outlook, Gmail, Whatsapp, Facebook, Twitter and etc.

The Role of WWW as Service on the Internet

The **World Wide Web abbreviated as WWW or the Web**. It is an information space where documents and other web resources are identified by **Uniform Resource Locators (URLs), interlinked by hypertext links**, and can be accessed through the Internet. Scientist **Tim Berners Lee invented the World Wide Web in 1989. He introduced the first web browser computer program in 1990 . the browsers available in general public on the Internet in August 1991 .**



WWW Operation

WWW works on client- server approach. Following steps explains how the web works:

1. User enters the URL (say http://www.tngovernmentjobs.in/) of the web page in the address bar of web browser.
2. Then browser requests the Domain Name Server for the IP address corresponding to www.tngovernmentjobs.in.
3. After receiving IP address, browser sends the request to web page and web server using HTTP protocol.
4. Then web server receives request using HTTP protocol and checks for the requested web page. If found it returns it back to the web browser and close the HTTP connection.
5. Now the web browser receives the web page, it interprets and displays the contents of web page in web browser's window.

Web Browser

A Web Browser is an **application software** that allows us to view and explore information on the web. A **web browser also called browser.** It is a software application for retrieving, presenting and traversing information resources on the World Wide Web. **Browsers are primarily use the World Wide Web,** they can also be used to access information provided by web servers in private networks or files in file systems

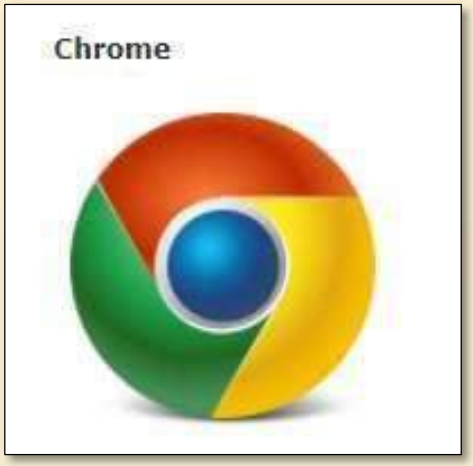
Figure 15.9 Web Browser

Browser	Vendor
Internet Explorer	Microsoft
Google Chrome	Google
Mozilla Firefox	Mozilla
Netscape Navigator	NetscapeCommunications Corp.
Opera	Opera Software
Safari	Apple
Sea Monkey	Mozilla Foundation
K-meleon	K-meleon

1.3 Familiar Web Browser

Looking for information on the internet is called **surfing or browsing**. To browse the internet, a software called the **web browser or browser** is used. E-commerce, social media, and many other things we take for granted today would be impossible without internet browsers. **Web browsers translates HTML documents of the website and allows to view it on the screen.**

Google Chrome is a freeware familiar web browser **developed by Google Inc**. It is best for its speed, simplicity, security, privacy and customization features. Google Chrome supports on Android 4.0 or higher, iOS 6.0 or higher, Mac OSX 10.6 or higher and Windows (XP sp2 or higher) and Linux system .



1.3 Familiar Web Browser

Mozila Firefox is a free and open source web browser **developed by Mozilla Foundation and Mozilla Corporation**. FireFox is **default browser in Ubuntu**.It supports Windows, Mac OS X, Linux and Android system .

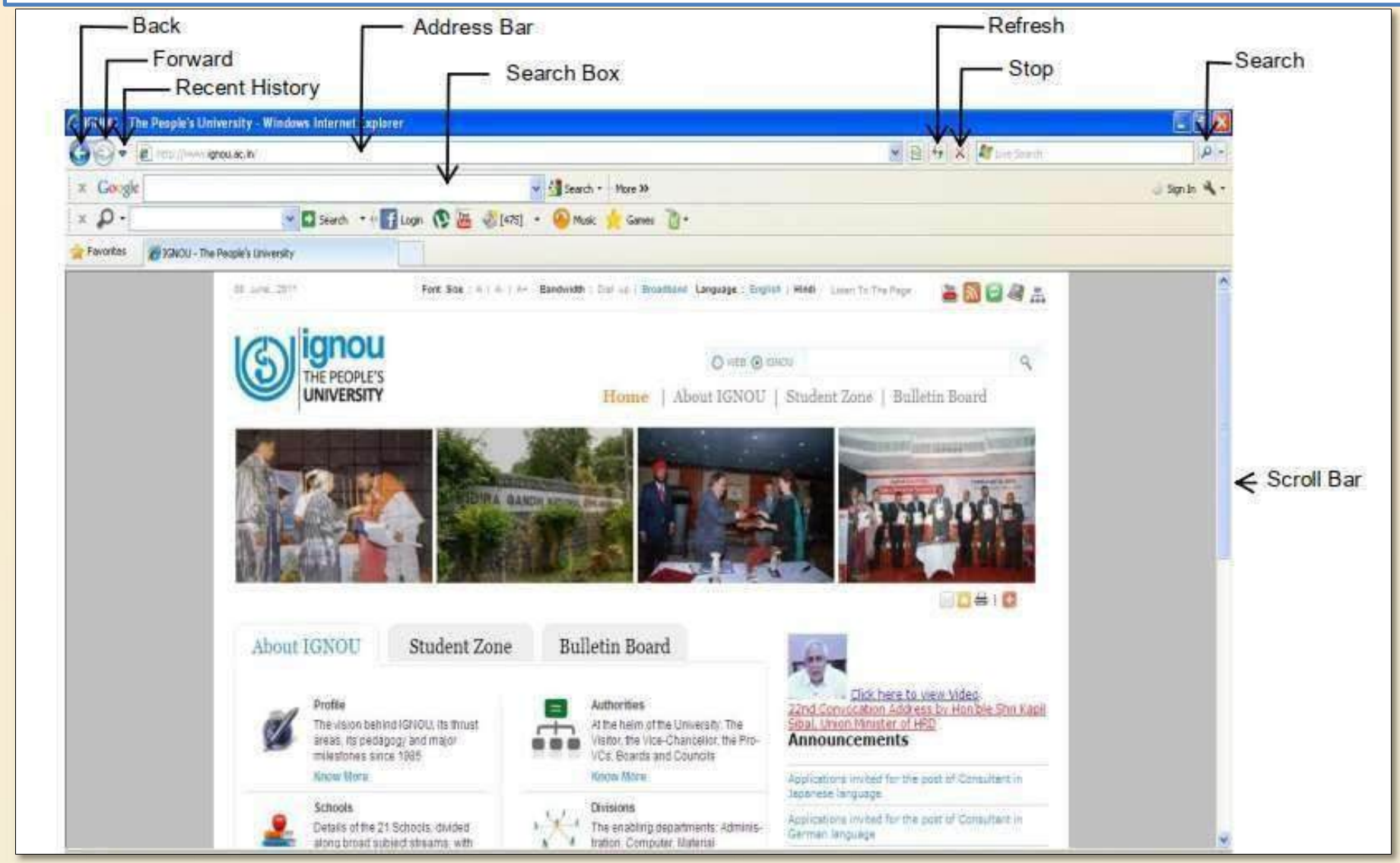
Internet Explorer commonly known as Microsoft Internet Explorer or **Windows Internet Explorer** is the first or default browser for a Windows PC. It is **developed by Microsoft.**

How Web Browser Display Web Pages : Its Features

A brief description about some of these interactions/buttons is as follows:

- **Back/Forward Buttons**: Back **button can be used by you for going back to the previously visited web page whereas the Forward button is used to visit the next pag**e (if you are not on the most recent page visited by you, this may happen when you have pressed the back button at least once).
- **Tab**: It allows you to view multiple web pages in the same browser without opening a new browser session.
- **Address bar**: Also **known as URL Bar is a place where you** can type the web page address that you want to retrieve from the web address. It also displays the address of the web page currently being visited by you.
- **Recent History**: This shows the **links to the web pages previously visited by you**.
- **Refresh**: This is also called as reload button. It reloads the current web page.
- **Stop**: It **cancels loading of the current web page.** This button is used when the page is in the loading state.
- **Home**: This button **will bring you back to the home page of your website**. Home page is the first page of any web site.
- **Search:** Search **box allows any term to be searched by the search engine from the web. It can also used for searching contents from the website visiting** .

As stated earlier, **a web browser is an application that allows you to interact with various web sites on the Internet. You can run a browser from your Windows Desktop**. Below figure shows some of the important interactions/displays that are available on a browser window:



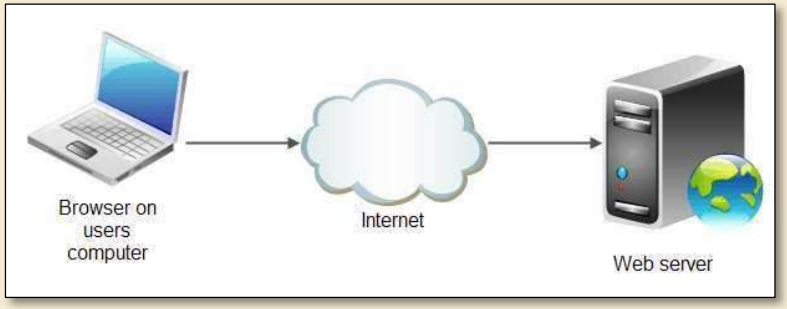
Web Server

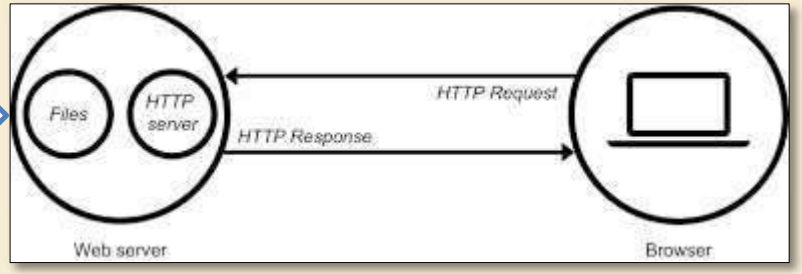
A **web server is used to store and deliver the contents of a website to clients such as a browser that request it. A web server can be software or hardware.**

The **server needs to be connected to the Internet so that its contents can be made accessible to others.**

The server is assigned a **unique domain name so that it can be accessed from anywhere using the domain name**. To develop and test a website using a personal computer, we need to first install a web server on that computer

The web browser from the client computer sends a request (HTTP request) for a page containing the desired data or service. **The web server then accepts, interprets, searches and responds (HTTP response) to the request made by the web browser**. The requested web **page is then displayed in the browser of the client. If the server is not able to locate the page**, it sends a page containing the error message (**Error 404 – page not found)** to the client's browser.





Types of Web Server

A **web server is a computer system application that processes requests via HTTP**, the basic network protocol used to distribute information on the World Wide Web. **The term can refer to the entire system, or specifically to the software that accepts and supervises the HTTP requests . There are many server today available they are managed and maintained by big companies. Some famous examples of web servers are following.**

Table 15.3 Web Server

S.N.	Web Server
1	Apache HTTP Server.
2.	Internet Information Services (IIS)
3.	Sun Java System Web Server

Web Server & Web-Browser communication in Detail

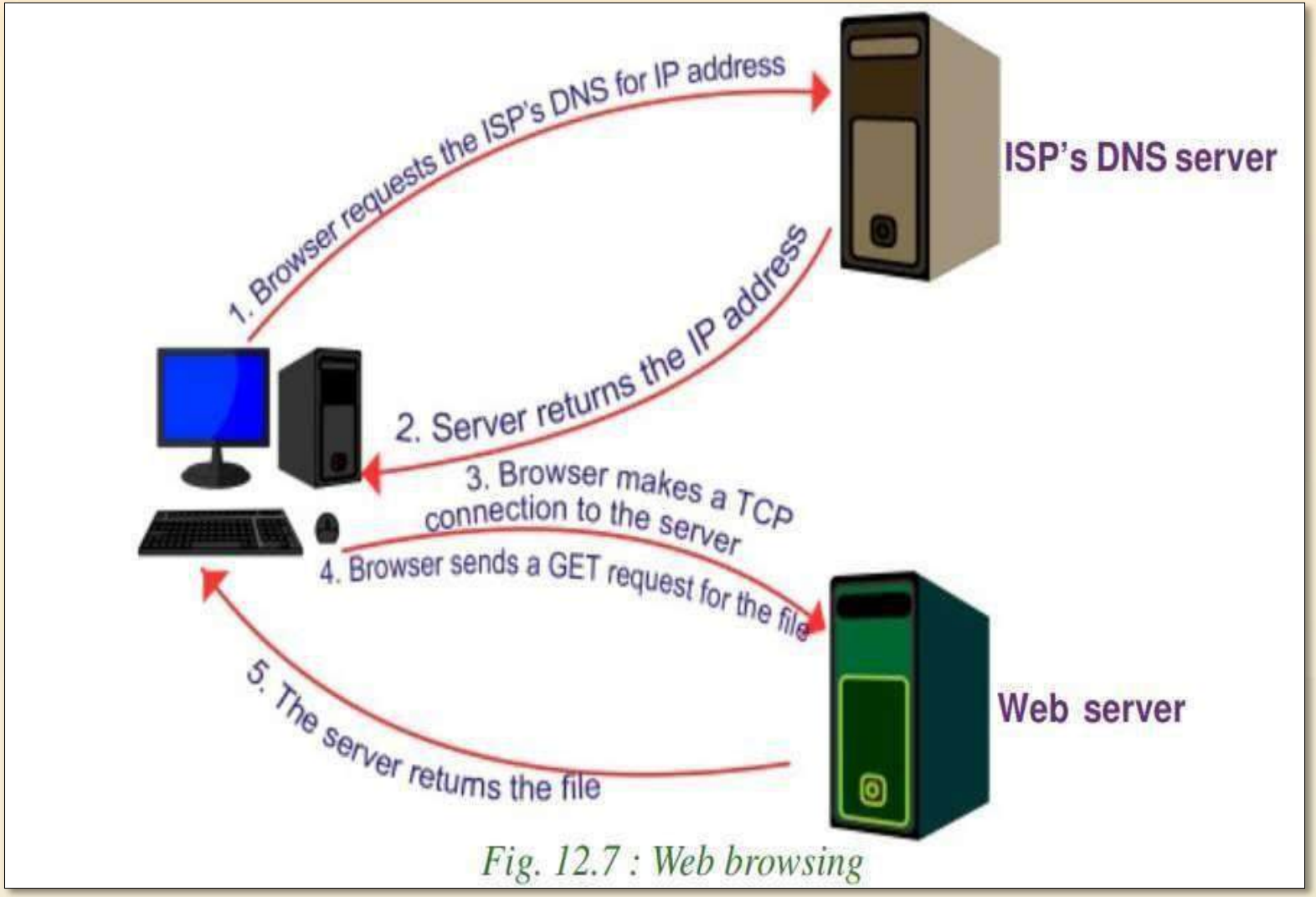


Fig. 12.7 : Web browsing

Web Pages

A Webpage is a document commonly written in **HyperText Markup Language (HTML) that is accessible through the Internet or other network using an Internet browser. A web page is accessed by entering a URL** address and may contain text, graphics and hyperlinks to other web pages and files.

Web Pages in Detail…

A **webpage is a page of a Website**. A web page can be **accessed by a URL** in a browser and that page can be copied and or send to a friend for review whereas websites are collections of multiple page that must be **navigated to view other content. Every page has a unique address called the Uniform. Resource Locator (URL). The URL locates the pages on the internet .**

Difference between Webpage and Website

Webpage	Website
Consists of a Single document displayed by a browser	A collection of multiple documents displayable by a browser
Shares a unique domain name	Has its own unique domain name
Makes up a website	Contains one or more webpages

Web pages are classified as Static and Dynamic Web pages

- Web pages are called Static when they remain **the same whenever it is visited. Examples of static Websites are website owned by Small business organizations,** School websites.

- Websites that **displays marks of Public Examinations and Entrance Examinations changes when different register numbers are given.** Such websites are called as Dynamic Websites. Eg,. **Websites of Government and Entrance Exams.**

Comparison of Static and Dynamic Web Pages

Static Web Page	Dynamic Web Page
The content and layout of a web page is fixed	The content and layout may change during run time
Static Web pages never use databases	Databases is used to generate dynamic content through queries
Static web pages directly run on the browser and do not require any server side application program	Dynamic web pages runs on the server side application programs and displays the results
Static Web pages are easy to develop	Dynamic web page development requires programming skills

Search Engine

A 'web search engine' or search engine is a software system that is designed **to search for information on the World Wide Web.** Search engines, sometimes called **search services**, allow an individual to search the contents of pages and files on the World Wide Web.

The **Search Engines** are used to search any information from the cyber space. Although there are many search engines, but only a few of them are frequently in use. In the top ten search engines, **Google, Bing and Yahoo** are takes first three places respectively.

Search engines are categorized similar to print indexes into **general, subject, and multithreaded, parallel, mega search, or meta-search engines.**

Figure 15.10 Search Engines

Why we need Search Engine?

There are millions of pages available on the Internet that contain information on a variety of topics. But it is very difficult to search for a topic in this large collection of web pages. Internet search engine websites are special programs that are designed to help people to find information available in World Wide Web. Search engine programs search documents available on World Wide Web for specified keywords and return a list of the documents/web pages matching the keywords.

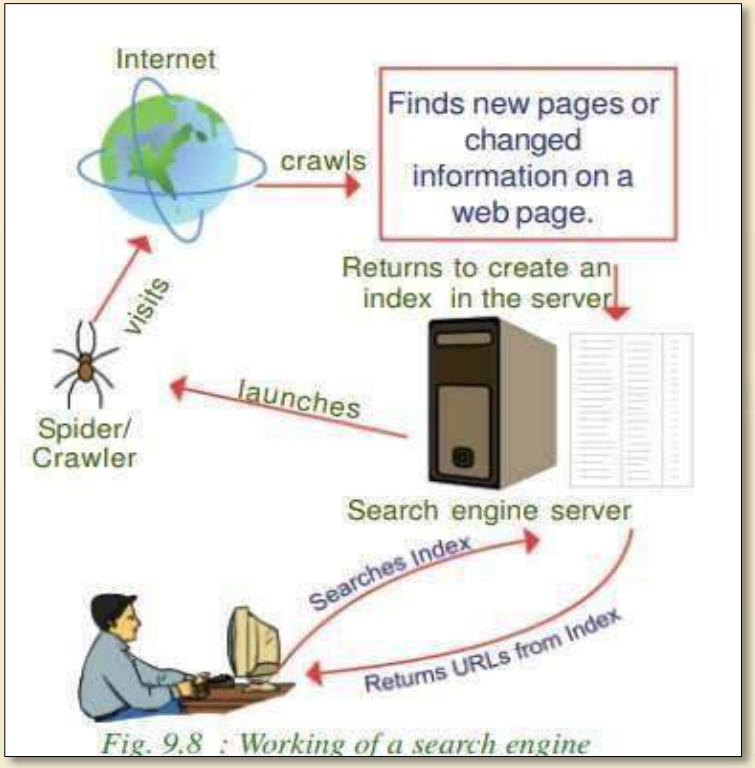
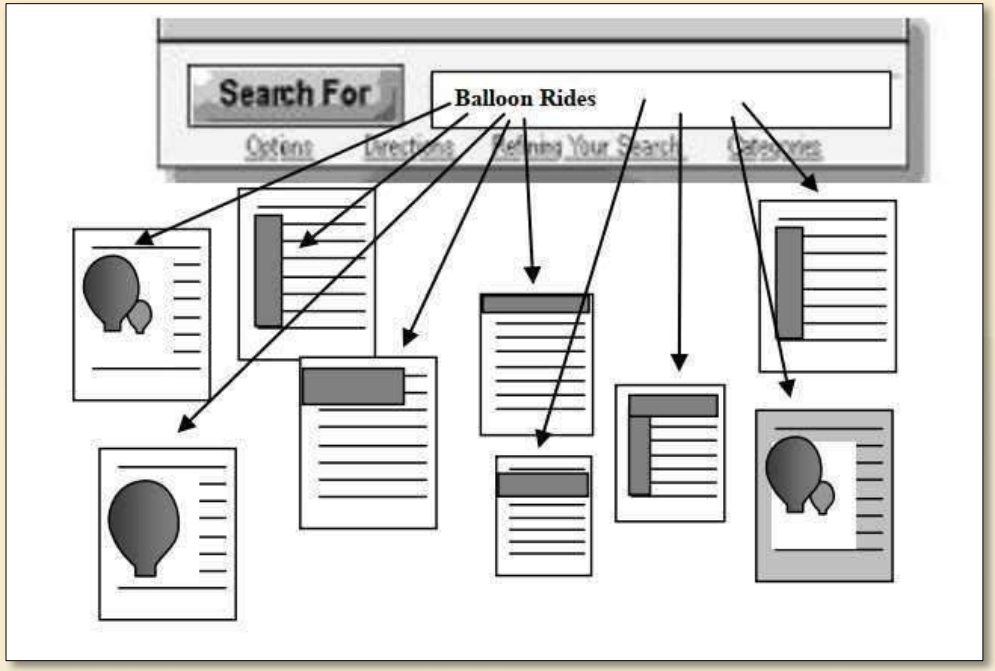


Fig. 9.8 : Working of a search engine



Search Engine Types

Some of the basic categories of Search engines are :

(A) Primary Search Engines: Such **search engines use web crawlers or spiders to traverse the web and scan websites for key words, phrase**s, to generate database of web pages having some indexing or classification. Google and Alta Vista are examples of primary search engines.

(B) Web directory: Web directories organize information into categories and subcategories or directories. You can search a **web directory for all those entries that contain a particular set of keywords. Directories differ from** search engines in the way they organize information. Yahoo is an example of web directory.

(C) Meta search engines: Such search engines pass your queries to many search engines and web directories and present summarized results to the users. Some of the examples of meta search engines are — **Dogpile, Infind, Metacrawler, Metafind** and Meta-search.

Working procedure of Search Engine

- **Spidering or Web crawling: Spider or Web crawler is a computer program that browses the web pages of WWW in a systematic, automated manner. Search Engines use spider for getting up-to-date data on web sites**. They are used to create a copy of the pages visited by them for later processing to create Index.

- **Indexing:** Once, the spiders have completed the task of finding information about Web pages, the search engine must store the information in such way that you are able to use it. The search engine may provide some information relating to relevance of information may be in the form of Ranking. Thus, a search engine may **store the keywords of a web page, number of times that word appeared on the page, the URL of the page. This is one of the reasons that a search for the same word on different search engines will produce different** results. Since, the data that is to be stored for indexing is large, therefore, search engine may encode it. **The Index is created with the sole purpose, that is, it allows you to find the information on the Internet quickly.**

- **Searching:** When a user enters a **query into a search engine, the engine examines its index and provides a listing of best-matching web pages according to its ranking criteria. This short list, usually, have a short summary containing the tile of the document and sm**all part of the text. Most search engines support **Boolean search.** Some simple example of a search is given below: To find website which contains —java tutorial‖, you may type **Java tutorial** in the search box of the browser. The search will look for keywords —Java‖ AND —Tutorial‖; the search expression will retrieve all those records where both the terms occur.

Working of Search Engine Continues..

Searches	Website: www.google.co.in	Website www.yahoo.co.in
Web Search You just type any word for e.g. New Delhi and click search The Result Screens	Google has a very large number of indexed pages.   	Yahoo also has faster ways to find the information.  

Working of Search Engine Continues..

On Home Page near search button there is option Advance Search. If you Click that button you get this screen	Advance search can help you to create more specific search. 	Yahoo advance search is primarily category based 
Image Search	Google has a very good Image Search facility on the Web. It has more than one billion indexed images for viewing.	Image Search of Yahoo! allows you to search millions of images from across the Web.
Other Searches	You may be able to do many other types of searches including scholar for scholarly articles, books, maps, news and many more categories	You may able to perform searches using yahoo such as news, products etc.

Domain Name

Domain Name:

A domain name is an identification a string that defines a area of administrative autonomy, authority or control within the Internet. Domain names are formed by **the rules and procedures of the Domain Name System (DNS)**.

Any name registered in the DNS is a domain name. Domain names are used in various networking backgrounds and application-specific naming and addressing purposes. **In general, a domain name represents an Internet Protocol (IP) resource, such as a personal computer used to access the Internet, a server computer hosting a web site**.

There are several domain names available:

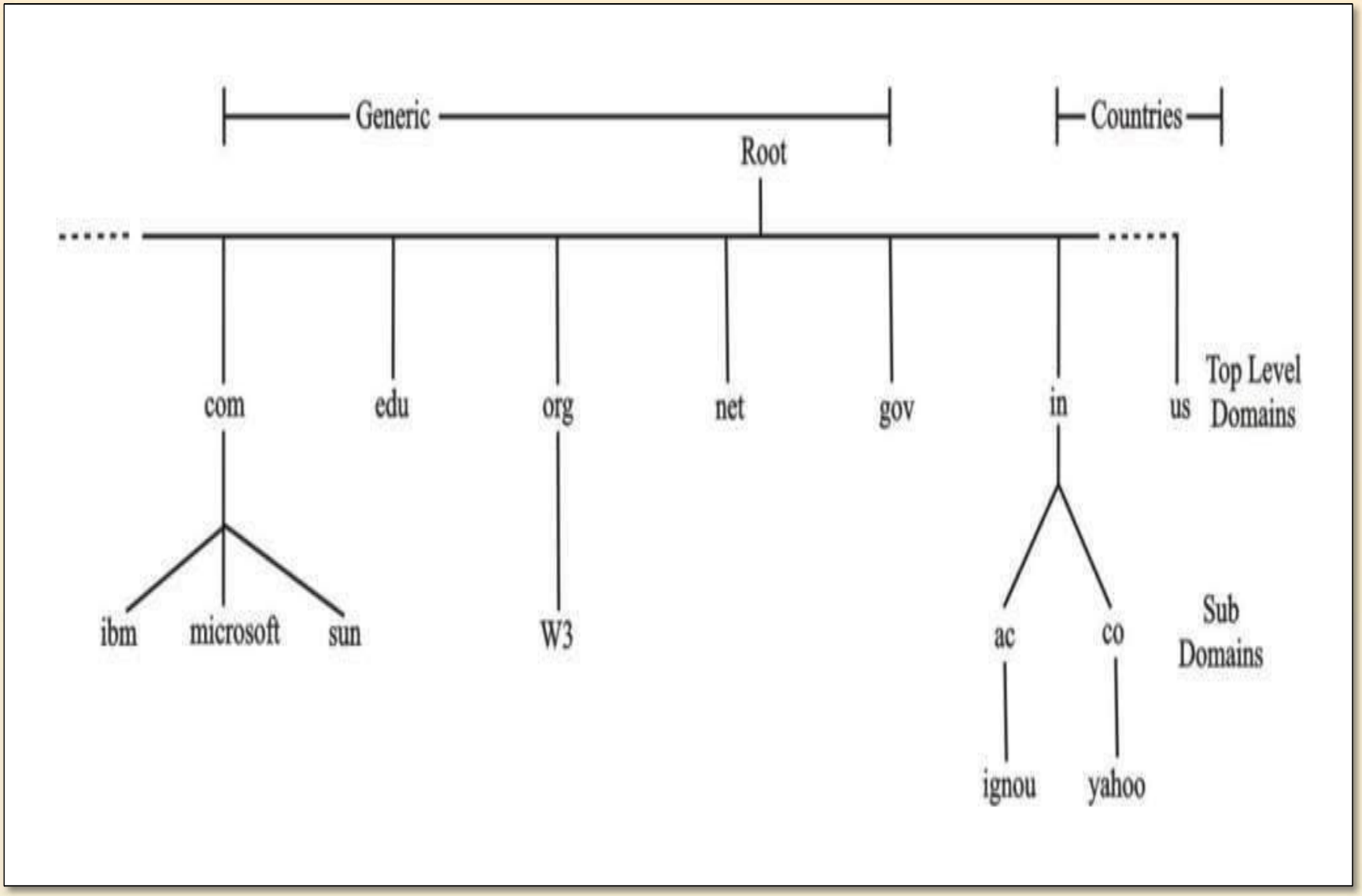
Generic domain names such as **.com, .edu .gov, .net.**

Country level domain names such as **au, in, za, us.**

- **com** - Commercial business
- **edu** - Educational institutions
- **gov** - Government agencies
- **mil** - Military
- **net** - Networks organization
- **org** - Organizations (nonprofit)

Country Level Domain Name	Description
.in	India
.au	Australia
.us	United States of America
.jp	Japan
.ru	Russia
.sg	Singapore

Domain Name


Generic
Countries
Root
com
edu
org
net
gov
in
us
Top Level Domains
ibm
microsoft
sun
W3
ac
co
Sub Domains
ignou
yahoo

Domain Name System

An **Internet or Web address is used to view a web page**. When you are viewing a Web page, the web address of the page appears in the Address bar in the browser. **They are very cumbersome to remember. For example, to visit IGNOU website the address *www.ignou.ac.in* is far simpler than that of an IP address like 190.10.10.247**. Obviously, what we want to use simpler textual domain addresses instead of complex IP addresses.

However, to enable the **use of simple textual address, you will require a service that will map these text based names to respective IP addresses automatically**. Such a service was designed in 1983 by **the University of Wisconsin with the name Domain Name System (DNS).**

In the present day, **Internet, Domain Name System (DNS) should keep track of address of each computer or any other internet device and email addresses**. The name servers translates the web address or email address to respective IP address.

For example, the name server translates address like *www.ignou.ac.in* into a computer understandable IP address. It sounds simple, but remembers on Internet you are dealing with million of addresses and every day this list is increasing. **All these computers have a unique address. Therefore, DNS follows a hierarchical naming scheme that is supported by distributed database system to ensure no duplicate names are issued at all**.

Internet, Intranet and Extranet

The **Internet** works by using a protocol called TCP/IP. TCP/IP allows one computer to talk to another computer via the Internet through compiling packets of data and sending them to right location.

An extranet is a private network that uses Internet technology and the public telecommunication system to securely share part of a business's information or operations with suppliers, vendors, partners, customers, or other businesses.

An Intranet is a website used by organizations to provide a place where employees can access company information (eg policies, procedures, staff, directory, department info), tools (quick links to common apps, forms etc.) and (collaborate (to social sharing tools similar facebook).

Domain Name System(DNS), is The **heart of intranets and the internet through which computers can contact each other and do things such as exchange electronic mail or display Web pages. The** Internet Protocol (IP) uses this Internet address information and **the DNS to deliver mail and other information from computer to computer**

URL

Uniform Resource Identifier or URI is a unique identifier to identify a resource located on the web**. URI identifies a resource (hardware or software) either by its location or by its name or by both.** URL is Uniform Resource Locator and provides the location and mechanism (protocol) to access the resource. Examples of URI identifying resources using location (i.e., URL) are: https://www.mhrd.gov.in http://www.ncert.nic.in, http://www.airindia.in,etc.

URL is sometimes also called a web address. However, it is not only the domain name but contains other information that completes a web address, as depicted below:

In the above URL, http is the protocol name, it can be **https, http, FTP, Telnet**, etc. www is a **subdomain**. ncert.nic.in is the domain name. **Note: These days it is not mandatory to mention protocol and subdomain while entering a URL. The browser automatically prefixes it**

URL continues..

A **URL is also like an address that shows where a particular page can be found on the World Wide Web.** Every server on the internet has an IP number, a unique number consisting of four parts separated by dots. The IP number is the server's address

At times the number keeps changing hence it is harder for people to remember number than **to remember word combinations. So, addresses are given "word-based" addresses called URL. The URL and the IP number are one and the same.**

Email

Electronic **mail or email is information stored on a computer that is exchanged between the two users over telecommunications.** Email is a message that may **contain text, files, images or any other attachments sent** through a network to a specified individual or group of individuals .

E-mail has become an extremely popular communication tool. The e-mail will be delivered almost instantly in the recipient's mail box (Inbox). Apart from text matter, we can send files, documents, pictures, etc. as attachment along with e-mail. The same e-mail can be sent to any number of people simultaneously. Figure 9.10 shows a sample e-mail message.

Most of you will have an e-mail address. The structure of an e-mail address is: user name@domain name. An example of an e-mail address is

scertkerala@gmail.com

An e-mail address consists of two parts separated by @ symbol. The first part *scertkerala* is the username that identifies the addressee and the second part *gmail.com* is the domain name of the e-mail server, i.e., the name of the e-mail service provider.

E-mails can be accessed using websites like *gmail.com*, *hotmail.com*, etc. that provide web applications consisting of functions to send, receive, forward, reply and organise emails . Such a facility is popular and is commonly referred to as web mail.

Working of Email

Have you ever wondered how e-mail is sent from your computer to a friend on the other side of the world? When an e-mail is sent from your computer using web mail or e-mail client software, it reaches the e-mail server of our e-mail service provider. From there the message is routed from sender's e-mail server all the way to the recipient's e-mail server. The recipient's e-mail server then delivers the e-mail to the recipient's mail box (inbox), which stores the e-mail and waits for the user to read it. Simple Mail Transfer Protocol (SMTP) is used for e-mail transmission across Internet. Figure 9.12 shows the working of e-mail.

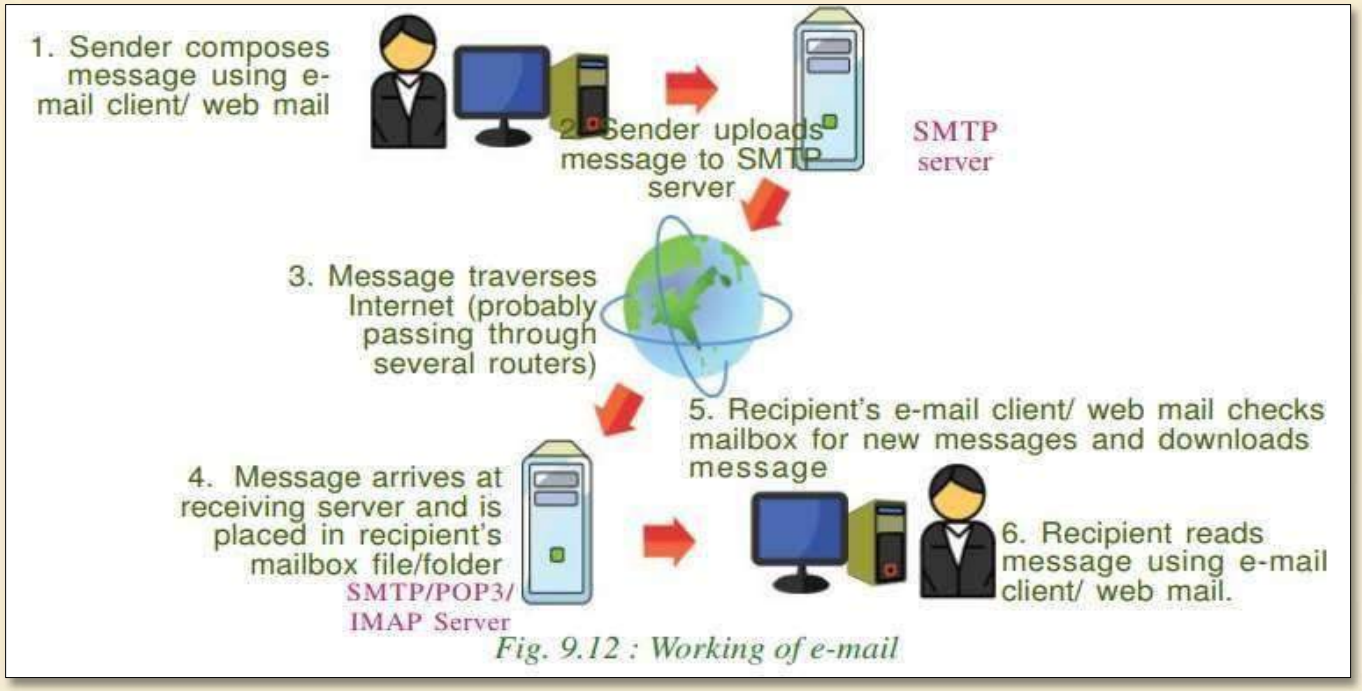


Fig. 9.12 : Working of e-mail

Advantages of Email

The benefits of using e-mail facility are listed below.

- **Speed**: An e-mail is delivered instantly to any location across the globe. We can send the same e-mail to multiple users simultaneously.
- **Easy to use**: We can send and receive e-mails, organise our daily conversations and save them easily on our computer.
- **Provision of attachments**: The attachment feature allows to send pictures, files, documents, etc. along with e-mail.
- **Environment friendly**: e-mails do not use paper and save a lot of trees from being cut down.
- **Reply to an e-mail**: When we need to reply to an e-mail, we can use the provision of attaching previous e-mails as reference. It helps to refresh the recipient about the subject.
- **Cost-effective**: When compared to fax or conventional mail, e-mail is less expensive.
- **Available anywhere anytime**: Messages can be read at user's convenience. Access to mail box is available anytime.

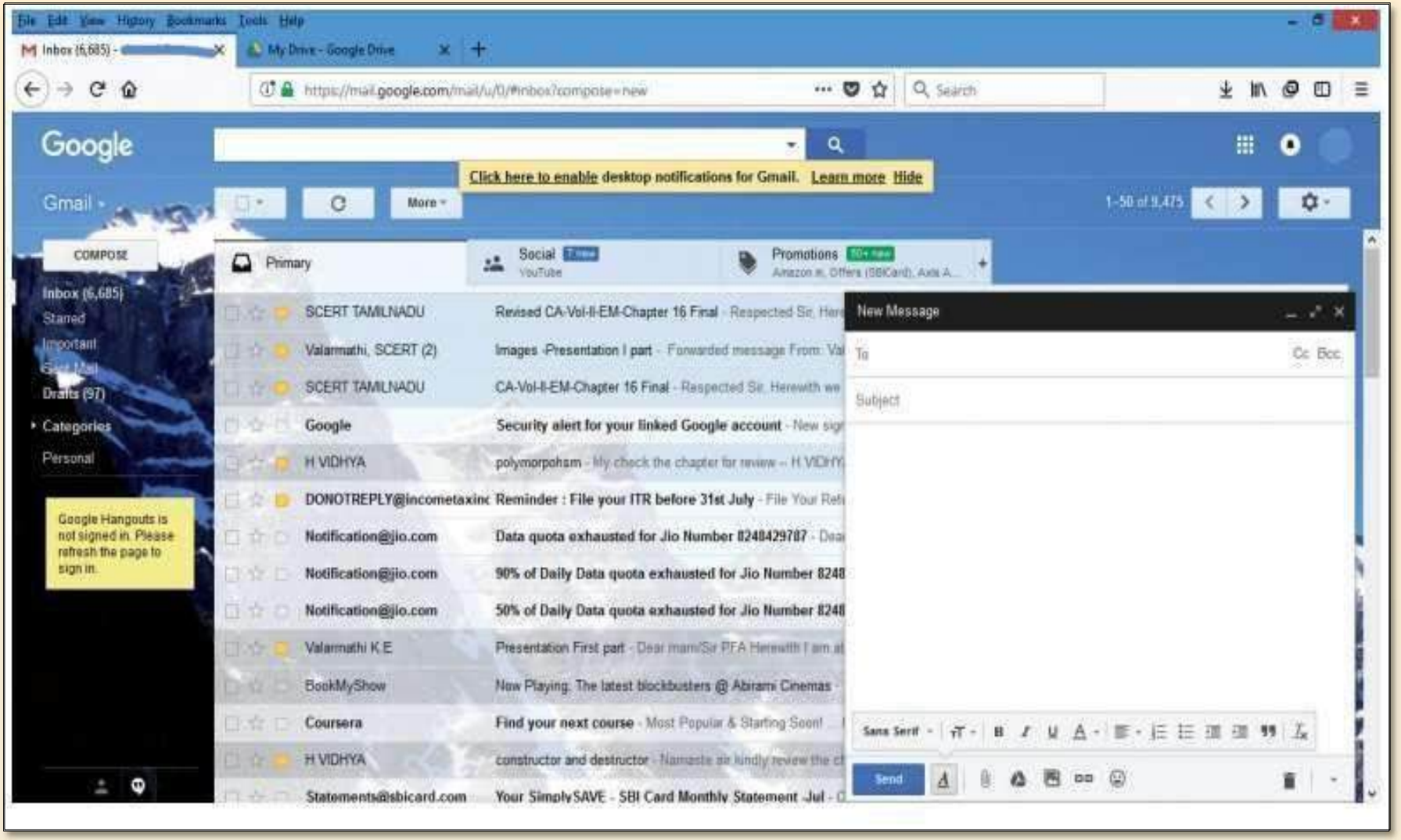
In addition to text messages being sent over e-mail, it is also possible to attach a file or other data in an e-mail. For example, an attachment could be a picture, PDF,word processor document, or any file stored on the computer.

Structure of E-mail

Click the **Compose** button and then writing an e-mail contents **When sending an e-mail message, several fields are required to be filled:**

- **The To field is** where you type the e-mail address of the person who is the recipient of your message.
- The **From** field should **contain your e-mail address**, If you are replying to a message, the To and From fields are automatically filled out; if it's a new message, you'll need to enter them manually.
- The **Subject should consist** of a few words describing the e-mail's contents. The Subject lets the recipient see what the e-mail is about, without opening and reading the full e-mail. This field is optional.
- The **CC (Carbon Copy)** field allows you to specify recipients who are not direct addressees (listed in the "To" field). This field is optional.
- The **BCC (Blind Carbon Copy)** field is similar to **CC**, except the recipients are secret. Each **BCC** recipient will receive the e-mail, but will not see who else received a copy. The addressees (anyone listed in the "To" field) remain visible to all recipients. This field is optional.
- Finally, the **Message Body** is the location you type your main message. It often contains your signature at the bottom; similar to a hand-written letter.

Structure of E-mail



Internet Threat

It's a dangerous world out there in the World Wide Web. Just as your mother may have told you to never talk to strangers, the same advice holds true for the virtual world. You may know to be wary of giving strangers your business bank account details. But can you be sure the website you're logging into is that of your bank and not a forgery created by a cybercriminal? **Cybercriminals use many different methods to lure you into parting with your confidential personal or business information. Hence you ought to be aware of the issues and be extra vigilant when online and offline**..

1. C**omputer virus:** A computer virus is a small piece of software that can spread from one infected computer to another. The virus could corrupt, steal, or delete data on your computer.
2. **Malware: Malware is short for "malicious software**." Malware is used to mean a "variety of forms of hostile, intrusive, or annoying software or program code." Malware could be computer viruses, worms, **Trojan horses, dishonest spyware, and malicious rootkits—all** of which are defined below.
3. **Trojan horse:** Users can infect **their computers with Trojan horse software simply by downloading an application they thought was legitimate but was in fact malicious**.
4. **Malicious spyware:** Malicious spyware is used to describe the Trojan application that was created by cybercriminals to spy on their victims.
5. **Computer worm:** A **computer worm is a software program that can copy itself from one computer to another, without human interactio**n.

Internet Threat

Botnet: A **botnet is a group of computers connected to the Internet that have been compromised by a hacker using a computer virus or Trojan horse. An individual computer in the group is known as a "zombie" computer**.

Spam: Spam in the security context is primarily used to describe email spam. Unwanted messages in your email inbox. Spam, or electronic junk mail, is a nuisance as it can clutter your mailbox as well as potentially take up space on your mail server.

Phishing: Phishing scams are fraudulent attempts by cybercriminals to obtain private information. Phishing scams often appear in the guise of email messages designed to appear as though they are from legitimate sources. For example, the message would try to lure you into giving your personal information by pretending that your bank or email service provider is updating its website and that you must click on the link in the email to verify your account information and password details.

Rootkit: A rootkit is a collection of tools that are used to obtain administrator-level access to a computer or a network of computers. A rootkit could be installed on your computer by a cybercriminal exploiting a vulnerability or security hole in a legitimate application on your PC and may contain spyware that monitors and records keystrokes.

Safe Internet rules

1. Don't **give out your personal information – Don't put personal details such as your home address, telephone numbers or parent's work address** online as cybercriminals can use this information to create a fake profile with your details

2. What **goes online, stays online – Use privacy settings to make sure only your friends and family can see photos you post. Avoid** posting holiday plans as criminals have been known to track your movements

3. Check **your security and privacy settings – Make sure your social network privacy settings are secured so only your friends can see your personal information and use your privacy settings to restrict who can see your posts, videos and photos**.

4. **Password safety – Sharing your password with your parents is a sensible idea, but avoid sharing your password with your friends, even if they promise they won't tell anyone! Also, when setting your password, make sure it isn't something** people may guess such as your pet's name. Use a mixture of letters, numbers and upper and lower case characters

5. Always **protect your mobile device – Make sure your mobile phone is pin-protected so all your personal information stored on it is safe. Download a security app which allows you to remotely wipe any personal data, should your mobile be lost or stolen.**

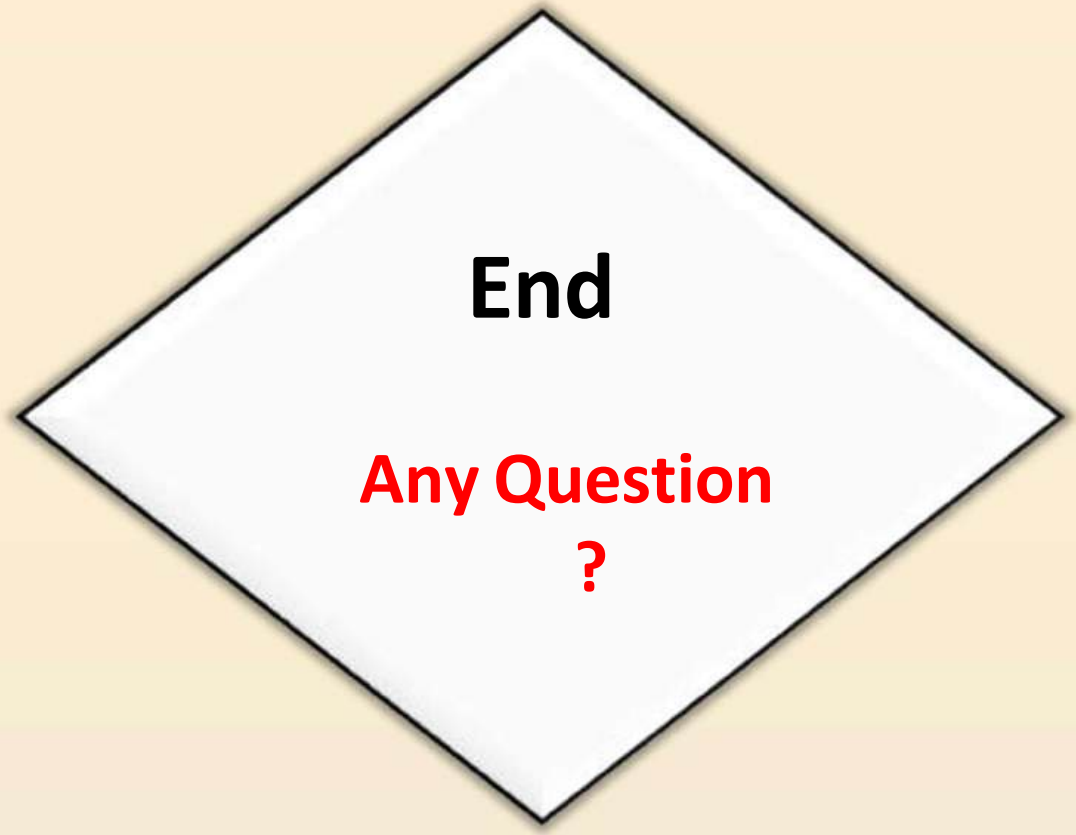
Safe Internet rules

6. Don't **talk to strangers online or offline – Don't meet up with strangers and let your parents, know if a stranger has tried to get in contact with** you online.

7. Listen to **the adults who know – Adults will always be worried about you. Help set their mind at rest and avoid chatting online with strangers**.

8. Be wary of **unsecured or unknown websites – When shopping online, use reputable and known retailers.**

9. Be careful what **links you click on – Avoid clicking links in an email, Instant Message or on your social network unless you are sure the message is from someone you know**


End
Any Question
?

INTRODUCTION TO IT SYSTEMS LAB
Subject Code- 2002207

Topic of Today's Discussion:
UNIT 1 LAB PRACTICES

Objective

COURSE OBJECTIVES:

This Lab course is intended to practice whatever is taught in theory class of 'Introduction of IT Systems' and become proficient in using computing environment - basic computer skills, basic application software tools, Computer Hardware, cyber security features, etc.

Outcome

COURSE OUTCOMES:

At the end of the course student will be able to comfortably work on computer, install and configure OS, assemble a PC and connect it to external devices, write documents, create various worksheets, prepare presentations, protect information and computers from basic abuses/ attacks.

Contents of LAB from UNIT 1

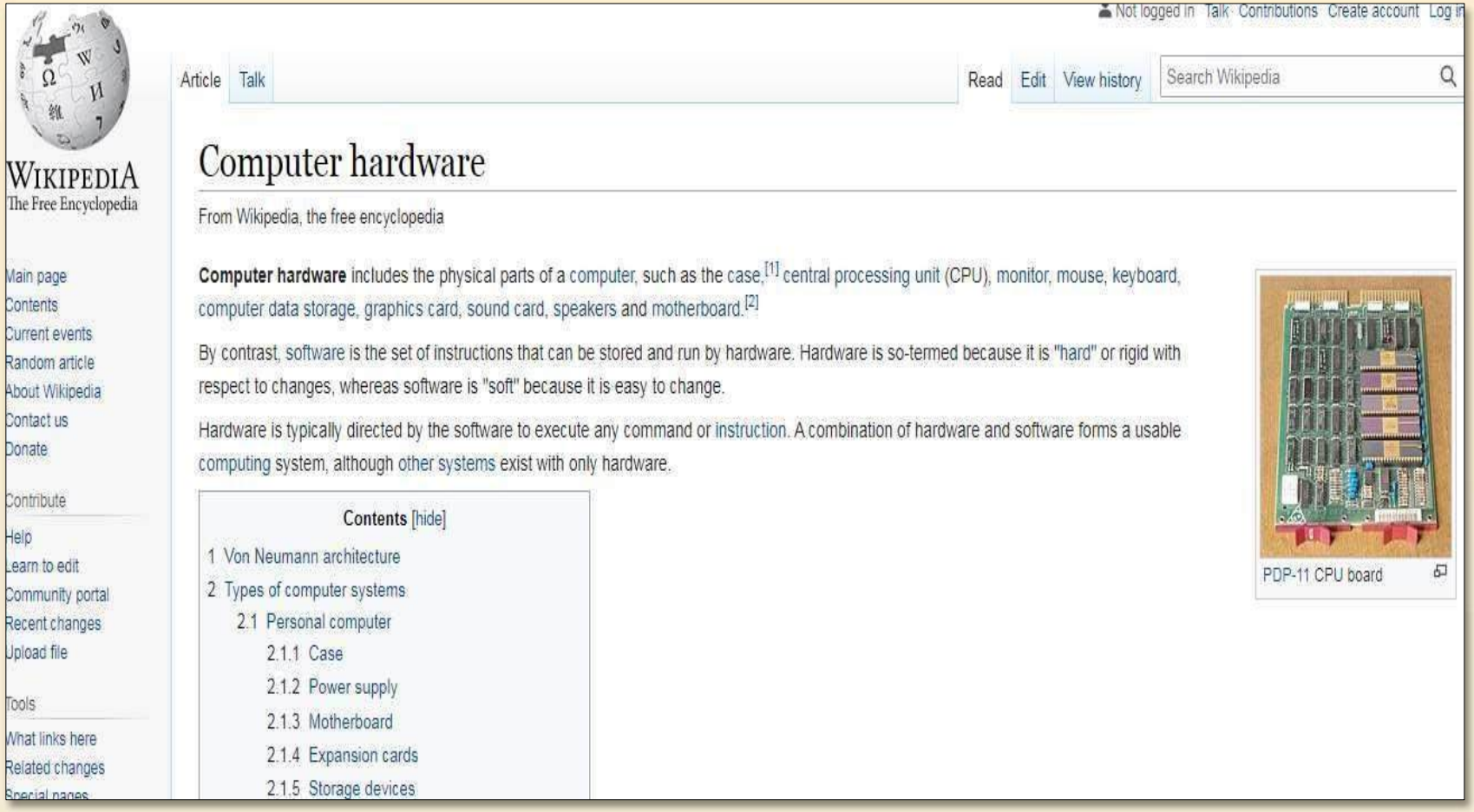
COUSRE CONTENT

S.No.	Topics for Practice
1	Read Wikipedia pages on computer hardware components, look at those components in lab, identify them, recognise various ports/interfaces and related cables, etc.
2	Connect various peripherals (printer, scanner, etc.) to computer, explore various features of peripheral and their device driver software.
3	Browser features, browsing, using various search engines, writing search queries.
4	Visit various e-governance/Digital India portals, understand their features and services offered.

LAB 1

Topic: Lab work 1

Read Wikipedia pages on computer hardware components. Look at those components in lab, identify them, recognize various ports/interfaces and related cables, etc.



WIKIPEDIA
The Free Encyclopedia

Not logged in Talk Contributions Create account Log in

Article Talk | Read Edit View history | Search Wikipedia

Main page
Contents
Current events
Random article
About Wikipedia
Contact us
Donate

Contribute
Help
Learn to edit
Community portal
Recent changes
Upload file

Tools
What links here
Related changes
Special pages

Computer hardware

From Wikipedia, the free encyclopedia

Computer hardware includes the physical parts of a computer, such as the case,[1] central processing unit (CPU), monitor, mouse, keyboard, computer data storage, graphics card, sound card, speakers and motherboard.[2]

By contrast, software is the set of instructions that can be stored and run by hardware. Hardware is so-termed because it is "hard" or rigid with respect to changes, whereas software is "soft" because it is easy to change.

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.

Contents [hide]

1 Von Neumann architecture
2 Types of computer systems
  2.1 Personal computer
    2.1.1 Case
    2.1.2 Power supply
    2.1.3 Motherboard
    2.1.4 Expansion cards
    2.1.5 Storage devices

PDP-11 CPU board

LAB 1

Topic: Lab work 1

Read Wikipedia pages on computer hardware components. Look at those components in lab, identify them, recognize various ports/interfaces and related cables, etc.

https://en.wikipedia.org/wiki/Computer_hardware

LAB 2

Topic: Lab work 2

Connect various peripherals (printer, scanner, etc) to computer, explore various features of peripheral and their device driver software.

Connecting a wired USB mouse

Connect the USB cable coming from the mouse to one of the USB ports (shown right) on the back or side of your computer. If you are using a USB port hub, connect the mouse cable to that.

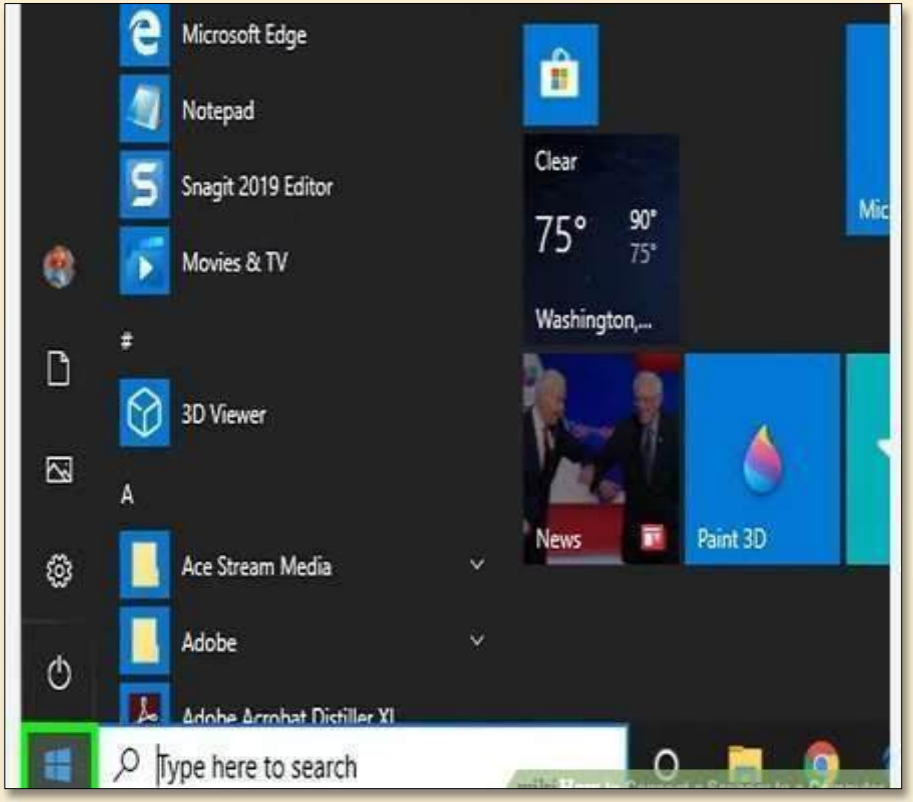
After the mouse is connected, the computer should automatically install the drivers and provide basic functionality. If the mouse you want to change how any special buttons work, additional software may need to be installed.

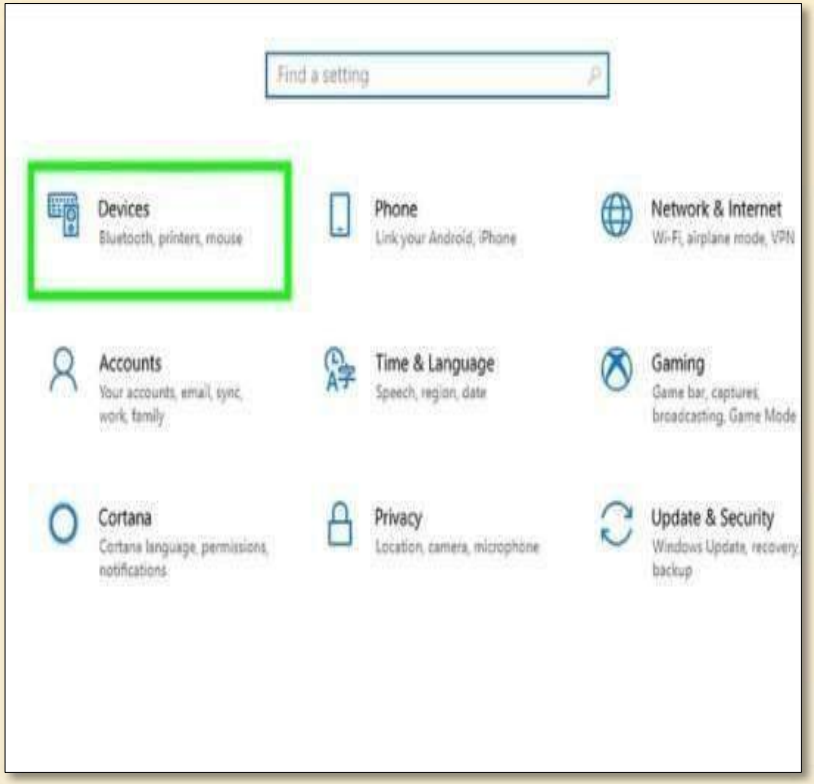
If the mouse is not functioning, see our mouse troubleshooting section.

LAB 2

Topic: Lab work 2

Connect various peripherals (printer, scanner, etc.) to computer, explore various features of peripheral and their device driver software.

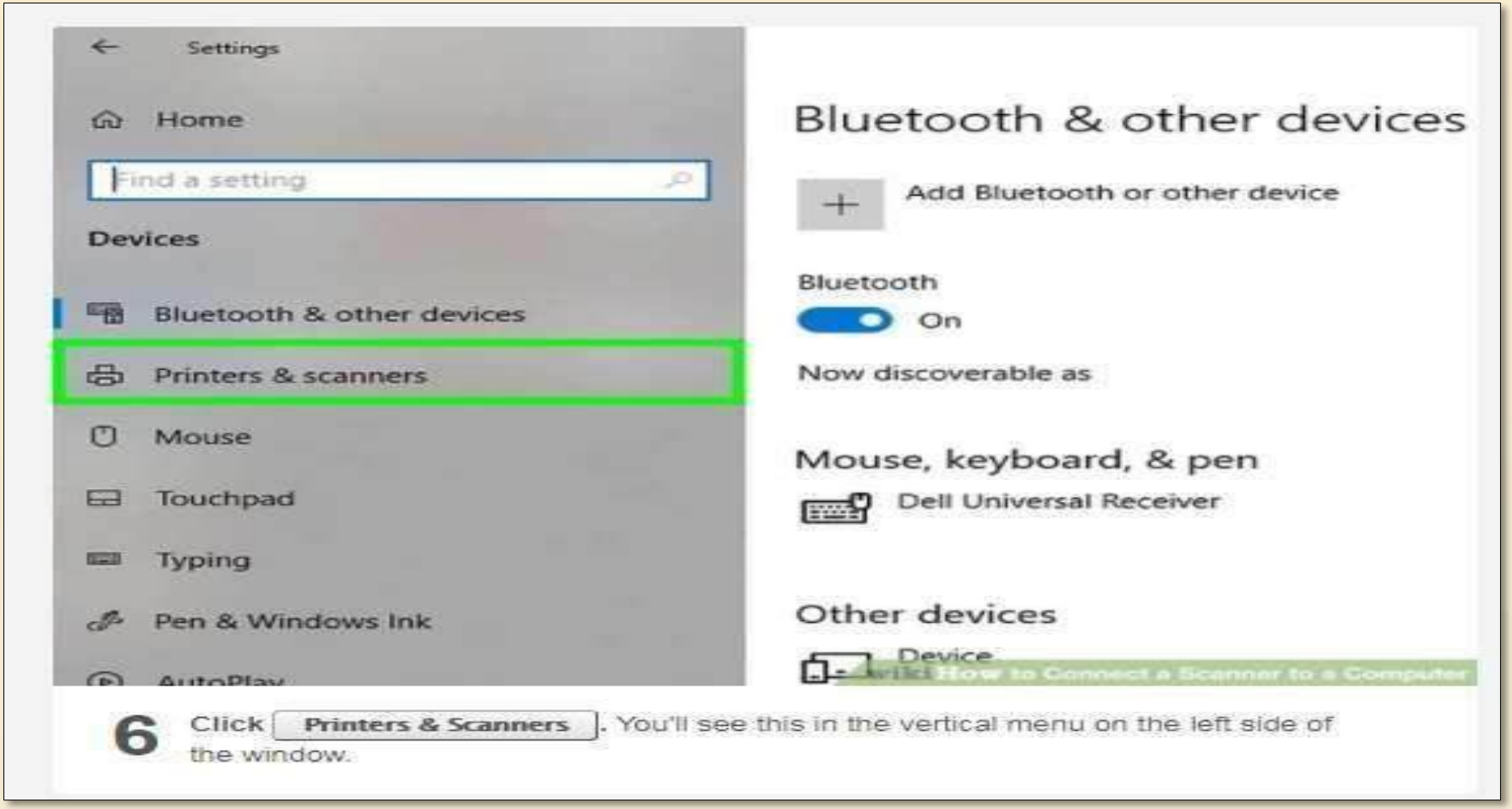




LAB 2

Topic: Lab work 2

Connect various peripherals (printer, scanner, etc.) to computer, explore various features of peripheral and their device driver software.



LAB 2

Topic: Lab work 2

Connect various peripherals (printer, scanner, etc.) to computer, explore various features of peripheral and their device driver software.

LAB 3

Topic: Lab work 3

Browser features, browsing, using various search engines and writing search queries.

LAB 3

Topic: Lab work 3

Browser features, browsing, using various search engines and writing search queries.

Search queries – the words and phrases that people type into a search box in order to pull up a list of results – come in different flavors. It is commonly accepted that there are three different types of search queries:

1. Navigational search queries
2. Informational search queries
3. Transactional search queries

A **navigational query** is a search query entered with the intent of finding a particular website or webpage. For example, a user might enter "youtube" into Google's search bar to find the YouTube site rather than entering the URL into a browser's navigation bar or using a bookmark. In fact, “facebook” and “youtube” are the top two searches on Google, and these are both navigational queries.

LAB 3

Topic: Lab work 3

Browser features, browsing, using various search engines and writing search queries.

A **transactional search query** is a query that indicates an intent to complete a transaction, such as making a purchase. Transactional search queries may include exact brand and product names **(like "samsung galaxy s3") or be generic (like "iced coffee maker") or actually include terms like "buy,"purchase," or "order."** In all of these examples, you can infer that the searcher is considering making a purchase in the near future.

informational search queries is used to search a broad topic (mango or computers) for **which there may be thousands of relevant results.** When someone enters informational search query into Google or another search engine, they're looking for information not looking for a specific site, as in a navigational query,

LAB 4

Topic: Lab work 4

Visit various e-governance/Digital India portals, understand their features and services offered.

Digital India is a flagship program of the Government of India with a vision to transform India into a digitally empowered society and knowledge economy.

LAB 4

Various Initiatives Under Digital India Initiatives

- **MyGov:** It aims to establish a link between Government and Citizens towards meeting the goal of good governance. It encourages citizens as well as people abroad to participate in various activities i.e. 'Do', 'Discuss', 'Poll', 'Talk', ‘Blog’, etc.

- **DigiLocker:** It serves as a platform to enable citizens to securely store and share their documents with service providers who can directly access them electronically.

- **e-Hospital-Online Registration Framework (ORF):** It is an initiative to facilitate the patients to take online OPD appointments with government hospitals. This framework also covers patient care, laboratory services and medical record management.

- **National Scholarships Portal (NSP):** It provides a centralized platform for application and disbursement of scholarship to students under any scholarship scheme.

- **DARPAN:** It is an online tool that can be used to monitor and analyze the implementation of critical and high priority projects of the State.

LAB 4

PRAGATI (Pro-Active Governance And Timely Implementation): It has been aimed at starting a culture of Pro-Active Governance and Timely Implementation. It is also a robust system for bringing e-transparency and e-accountability

Common Services Centres 2.0 (CSC 2.0): It is being implemented to develop and provide support to the use of information technology in rural areas of the country. The CSCs enabled kiosks with broadband connectivity to provide various Governments, private and social services at the doorstep of the citizen

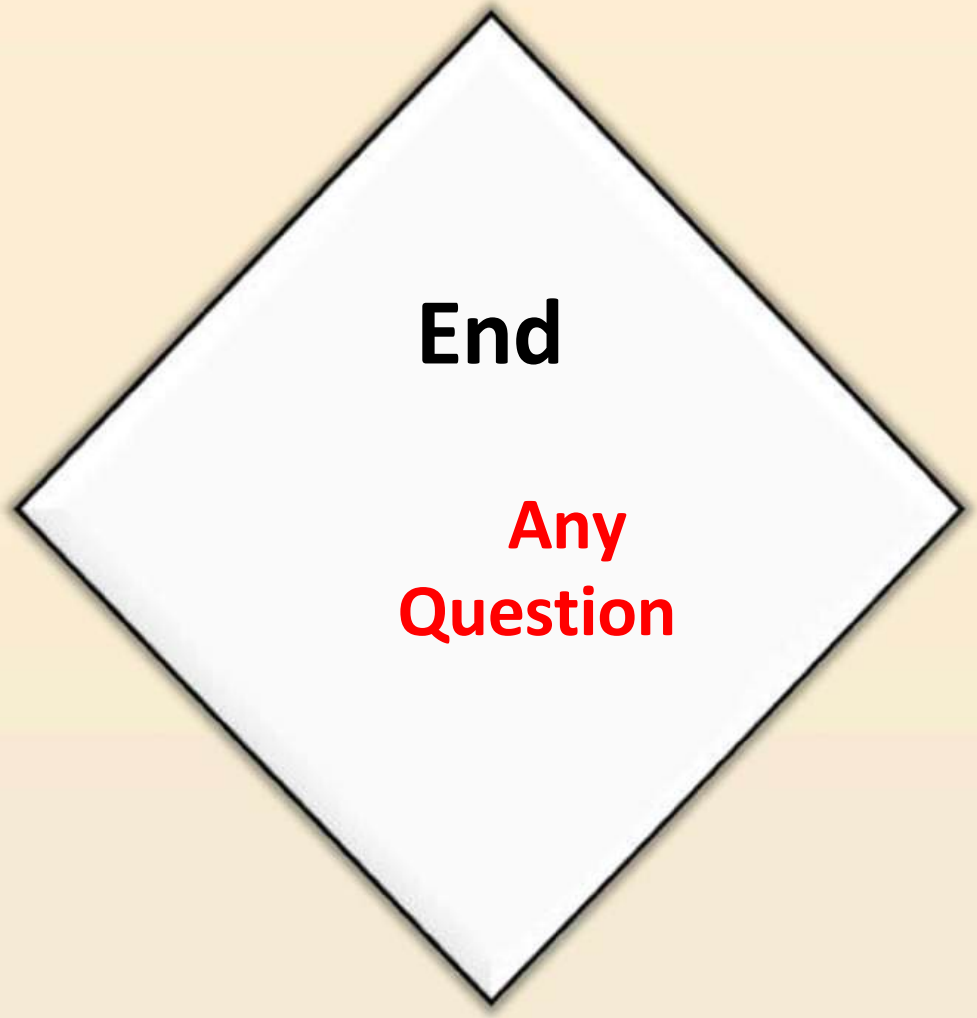
Mobile Seva: It provides government services to the people through mobile phones and tablets.

Jeevan Pramaan: It is an Aadhaar based Biometric Authentication System for Pensioners. The system provides authenticity to Digital Life Certificate without the necessity of the pensioner being present in person before his/ her Pension Dispensing Authority (PDA).

National Centre of Geo-informatics (NCoG): Under this project, Geographic Information System (GIS) platform for sharing, collaboration, location based analytics and decision support system for Departments has been developed.

LAB 4


9 Pillars of Digital India
Broadband
Highways
Public Internet
Access Programme
Information
For Everyone
Early Harvest
Programme
Universal Access
To Phones
IT For Jobs
Electronic Delivery
of Services
eKranti
Electronic Delivery
of Services
E-Governance
Reforming Government
through Technology
Electronic
Manufacturing
Target NET ZERO Import


End
Any
Question
?