

Computer Basics

We will study

- **Basic concept of computer system**
- **Classification of Computer**
- **Concept of Hardware and software and its types**

What is an Computer

❖ The Computer is an electronic device which can accept data manipulate the data according to user instruction and produce meaningful information and store the results for future use.

❖ Charles Babbage is called the “Father of the Computer” (Analytical Engine)

❖ Alan Turing is known as the Father of Modern Computer.

Characteristics of Computer

- ✓ Speed
- ✓ Storage
- ✓ Accuracy
- ✓ Automation
- ✓ Versatility or Multipurpose
- ✓ Consistency

Limitation of Computer

1. Cannot identify logical mistakes
2. Depend on users input
3. Not intellectual or emotional
4. Computers cannot learn from experience
5. Lack of Decision Making
6. If the instructions are incorrect, computers cannot fix it.

Classification Of Computers

Computers can be classified On the Basis of

- Generation
- Operating Principles
- Area of applications
- Size and Capability

Classification based on Generation:

❑ First Generation (1940-1956): ENIAC, UNIVAC-1, EDVAC

- Vacuum Tube based
- Big in size
- Electricity consumption is high
- Programming in machine language

❑ Second Generation (1956-1965): IBM1401, CDC1604, RCA 501

- Transistor based
- Smaller than first generation
- Electricity consumption is lower
- Programming in machine as well as assembly language.

❑ Third Generation (1965-1971): IBM-360, ICL-2900

- Integrated Circuit based
- Smaller, faster and more reliable than second generation
- Power consumption is lower.
- High level languages are used.

❑ Fourth generation (1971-1980): DEC10, STAR1000, PDP11

- VLSI microprocessor based
- Portable computers developed
- Concept of internet was introduced
- High level languages like C, C++ etc were used

❑ Fifth Generation (1980-onwards): Desktop, Laptop, Note Book

- ULSI microprocessor based Artificial Intelligence
- More user friendly with multimedia features
- Development of Natural language processing

Classification based on Operating Principles

- ❖ Analog Computer (uses continuous physical phenomena)
 - ❖ Digital Computer (performs calculations and logical operations with quantities represented as digits, usually in binary number system)
 - ❖ Hybrid Computer (Capable of inputting and outputting in both digital and analog signals)
- **A hybrid computer system offers a cost effective method of performing complex simulations**

Classification based on Area of Application:

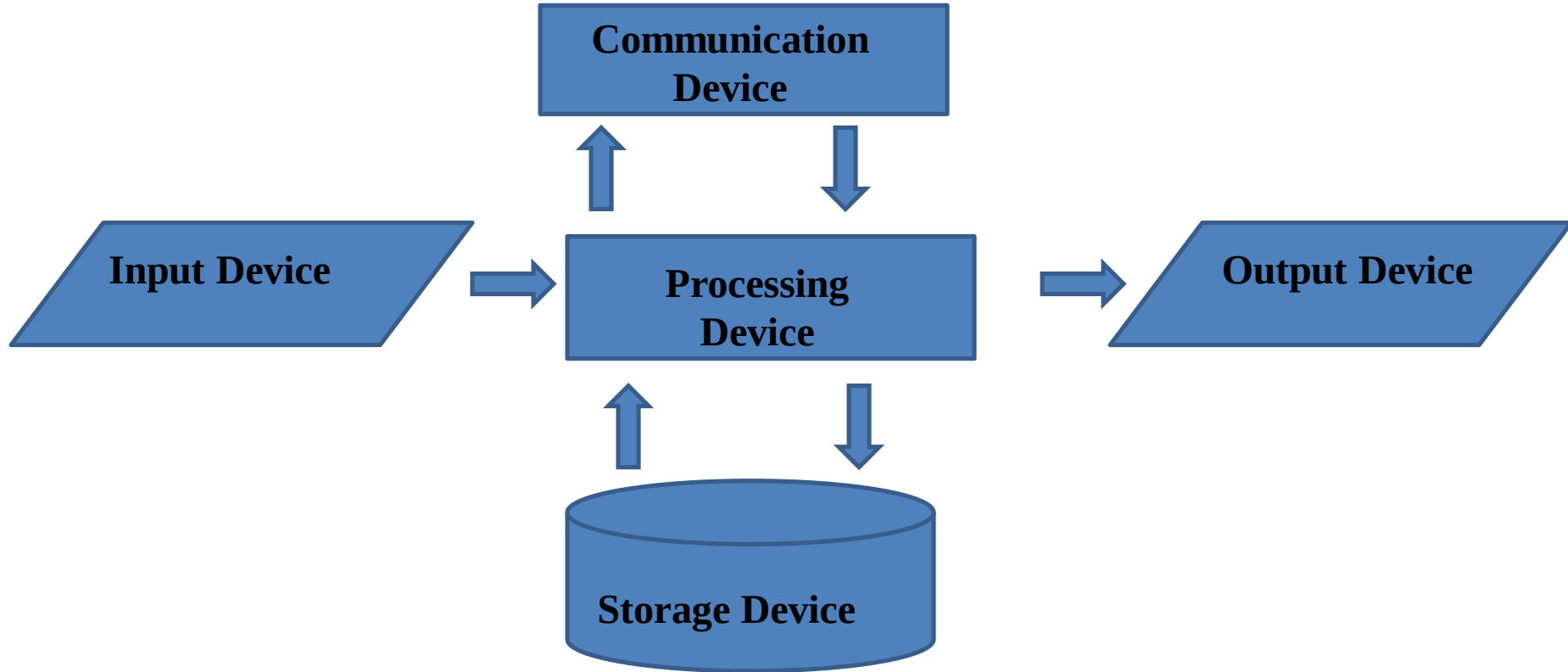
- ❖ Special Purpose Computers
- ❖ General Purpose Computers

Classification based on size and Capability:

- ❖ Microcomputer – a. Desktop b. Portables (Laptop, Notebook, Palmtop, Wearable computer)
- ❖ Minicomputer
- ❖ Workstation
- ❖ Mainframe
- ❖ Supercomputer

Computer Hardware: (Components of a computer)

Each piece of hardware for a computer can be classified into:



Input Device:

- **Keyboard**
- **Mouse**
- **Joy Stick**
- **Light Pen**
- **Scanner**
- **Microphone**
- **Webcam**
- **Magnetic Ink Card Reader (MICR)**
- **Optical Character Reader (OCR)**
- **Bar Code Reader**
- **Optical Mark Reader (OMR)**

KEYBOARD





MOUSE

SCANNER

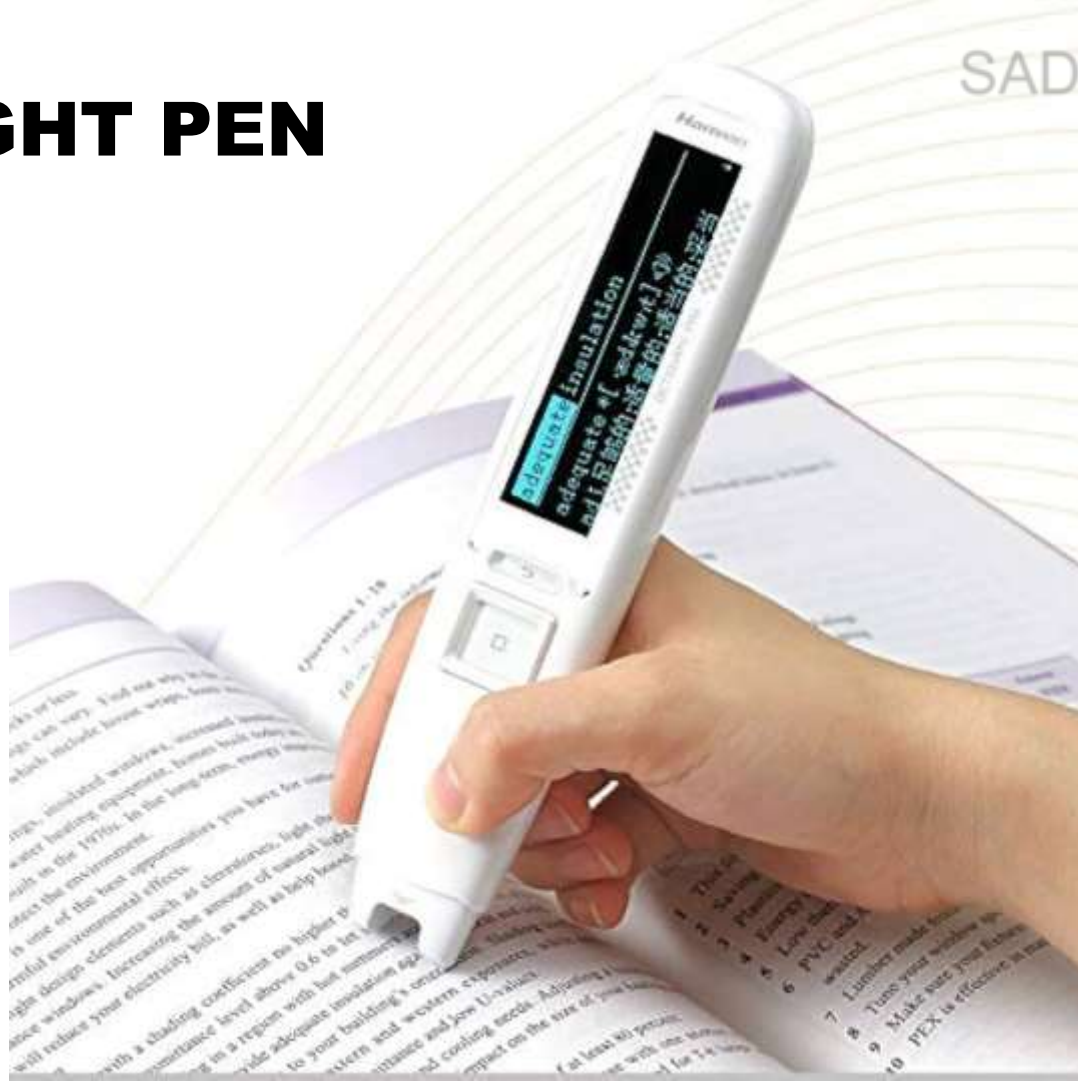


JOY STICK



LIGHT PEN

SADIYA COLLEGE



MICROPHONE



WEBCAM



MAGNETIC INK CARD READER(MICR)



OPTICAL CHARACTER READER(OCR)



BAR CODE READER



OPTICAL MARK READER(OMR)



Output devices:

Two types :

✓ Softcopy output devices



MONITOR



PROJECTOR



SPEAKER

✓ Hardcopy output devices:



PRINTER

Plotter



PLOTTER

Software:

Software is a set of programs, which is designed to perform a well-defined function. A program is a sequence of instructions written to solve a particular problem

There are two types of software:

- System Software
- Application Software

System Software:

Collection of many programs designed to operate, control and extend the processing capabilities of the computer itself. Eg. Operating system, Compilers, Interpreter etc.

System software serves as the interface between hardware and the user.

System software is further classified in three categories:

a)Language Translator

b)Utilities

c)Operating System

Application Software:

Designed to satisfy a particular need of a particular environment. It enables the user to complete tasks such as creating documents, spreadsheets, databases, sending email, designing graphics, running business, playing games etc.

Application software can be classified in to :

- **General –Purpose Software** (word processor)
- **Special-Purpose Software** (Payroll calculation, stock control)
- **Bespoke Software** (written for a single client, not shared among a large number of people)

Memory Unit (Storage Devices):

Computer Memory Types: Computer memory is primarily of three types

1. **Cache Memory:** is a very high speed semiconductor memory which can speed up CPU.
2. **Primary Memory or Main Memory:** Primary memory holds only those data and instructions on which computer is currently working. It is divided into two categories – RAM (Random Access Memory) and ROM (Read Only Memory)
 - **RAM** is the internal memory of the CPU for storing data, program and program result. Data in the RAM can be accessed randomly from the memory cells.
 - **ROM** is the memory from which we can only read but cannot write on it. The information is stored permanently in such memories. A ROM stores such instructions that are required to start a computer.

3. **Secondary Memory:** Secondary Memory storage devices are used to store large amount of data permanently. This is external memory. Eg: Hard Disk, CD-ROM, DVD etc.

Sl No	Unit	Description
1	Bit	The smallest unit of data in computing(0 or 1)
2	Nibble	A group of 4 bits is called nibble
3	Byte	A group of 8 bits(1byte = 8bits)
4	Kilobyte	1 KB = 1024 Bytes
5	Megabyte	1 MB = 1024 KB
6	Gigabyte	1 GB = 1024 MB
7	Terabyte	1 TB = 1024 GB
8	Petabyte	1 PB = 1024 TB

Basics of operating system

Operating system: An operating system is a program that controls the execution of application programs and acts as an interface between the user of a computer and the computer hardware.

Some commonly used operating systems are-

1. **UNIX-** It is a multi user operating system, which was first developed in 1990s. First OS written in C programming
2. **Windows OS-** Microsoft developed Windows Operating System. It was the first graphical user interface (GUI) operating system, released in 1985.

3. **Linux**- It is a unix like operating system that was designed to provide personal computer users a low-cost alternative.

4. **Mac OS**- The Macintosh Operating System is the operating system that was introduced by Apple Inc for Mac computers in the year 1984.

5. **Google android**- In 2003, Google released the Android mobile operating system for mainly touch-screen gadgets like tablets and smart phones.

6. **Apple iOS**- The iPhone OS was created by Apple in 2007 and is compatible with the iPad and other Apple mobile devices.

Functions of operating system

1. Device Management: The operating system keeps track of all the devices. So, it is also called the input/output controller that decides which process gets the device, when, and for how much time.

2. File Management: It allocates and de-allocates the resources.

3. Memory management: It keeps track of the primary memory, like what part of it is in use by whom. It also allocates memory when a process or program requires it.

4. Processor management: It allocates the processor to a process and then de-allocates the processor when it is no longer required.

5. Error detecting Aids: These contain methods that include the production of dumps, traces, error messages, and other debugging and error-detecting methods.

6. Job accounting: It keeps track of time and resources used by various jobs or users.

7. Security: It prevents unauthorized access to programs and data using passwords and other protection techniques.