

## **What is a computer?**

Computer is an electronic device that takes data, instructions and information as input and produce output (information) after processing it.

It is a machine that processes thousands of instructions in less than a second and produces outputs as instructed or programmed.

## **Advantages of computers**

### **1- Efficiency**

Machines are more efficient than humans. They can perform millions of calculations with less effort in

### **2- Reliability**

Work done by computer is more reliable than one done by humans. Computers perform according to the instructions given to it that makes output or results produced by these more accurate and reliable. For example, a computer can do millions of error free calculation in less than a second.

### **3- Storage**

Computers give you an advantage of storing large amount of data in one place. For example, you can store the data of whole library in one computer.

### **4- Fast results**

Computers are capable of doing many difficult tasks in very short time. Every day the processing speed of computers is increasing to make them work faster. Latest computers are capable of performing thousands of instructions and calculation in less than a minute which used to take hours with old PCs.

## **Basic terms for computer**

Whatever goes into the computer is called input. For example, text, graphic sounds, etc. In everyday life the example for input is a voting slip in a ballot.

### **Input Devices**

An input device is any peripheral (piece of computer hardware equipment) used to provide data and instruction to a computer, for example keyboard and microphone. Everyday life example is a hand that is used to put the voting slip in a ballot box. Thus hand is input device for ballot box.

### **Output**

Anything that comes out of a computer is called output. For example sound of a playing video in computer is the output.

## Output Devices

An output device is a hardware used to get the output from the computer. For example headphones are output device and used for listening sound in computer.

## Processing

Computer is given the data and instruction as input, which is processed to create output in the form of information. Data is a raw form of symbols, numbers, images, etc, whereas information is an organized, meaningful and useful form of the data. For example, some data (student roll number, name, total marks, obtained marks etc) from the mid exam is entered. Computer process the data, and creates a report of pass and fail students. This report is more organized and useful for us, and thus information rather than just data.

## Storage

Storage, also referred as memory, is the ability of a computer to store data, information or instructions. It can save digital data on RAM, hard disks or removable memory.

## Storage Devices

Storage devices are used to store data when they are not being used in memory. The most common types are USB drive, hard disks and CD-ROM and DVD.

## Hardware

Hardware refers to the physical elements of a computer. Examples of hardware in a computer are the keyboard, the monitor, the mouse and the processing unit.

In contrast to software, hardware is a physical entity, while software is a non-physical entity. Hardware and software are interconnected, without software; the hardware of a computer would have no function.

## Software

How does a computer use its hardware?

The term software refers to programs or sets of instructions that the computer uses to perform computer operations. Software can also be described as a collection of routines, rules and symbolic languages that direct the functioning of the hardware. Software is capable of performing specific tasks, as opposed to hardware which only perform mechanical tasks what they are mechanically designed for.

We can think or write instructions, but cannot touch them.

## **Characteristics of software**

Software is intangible (you cannot hold it like hardware).

It is weightless.

It does not exist as hardware.

Software is used to operate the computer.

## **Types of Computers**

There are five basic types of computers.

### **Super Computers**

Are the fastest computers, and because of their speed and memory, are capable of performing operations that would not be practical for PCs or mainframes.

### **Advantages of super computers**

High speed

Most Accurate

Most Expensive

Examples

Titan-Computers, k-Computers and Tianhe-2

### **Mainframe Computers**

Mainframes are computers where all the processing is done centrally, and the user terminals are called "dumb terminals" since they only input and output (and do not process).

Mainframes are computers used mainly by large organizations for critical applications, typically bulk data processing such as census. Examples: banks and airlines.

#### **Examples**

PTC, PIA, Banks and other organizations in Pakistan use mainframe computers

#### **Servers**

A server is a central electronic machine that exchange data with all linked machines.

#### **Examples**

Dell, HP and Acer

## Microcomputers

PC is an abbreviation for a Personal Computer, it is also known as a Microcomputer. Its physical characteristics and low cost are appealing and useful for its users. Throughout the 1970s and 1980s, home computers were developed for household use, offering some personal productivity, programming and games, while somewhat larger and more expensive systems (although still low-cost compared with minicomputers and mainframes) were aimed for office and small business use.

### Examples

HP, Dell, IBM and Apple Macintosh

## Game Console

Game Console is a device that allows one or more person to play game. These are portable devices.

### Examples

Microsoft XBOX 360, Nintendo Wii and Sony PlayStation

## Mobile Computers

A portable computer is a small personal computer designed for mobile use. A portable computer integrates all of the typical components of a desktop computer, including a display, a keyboard, a pointing device (a touchpad, also known as a track pad, or a pointing stick) and a battery into a single portable unit.

### Example

Laptop computers

## Mobile Devices

Mobile device is a computing device that can set in hand easily. It has less computing power than personal computers.

### Example

Book Reader, Digital Camera and smart phones

## Embedded Computers

An embedded computer is a small and less computing power device that can be fixed as a component in any product.

**Example**

DVD Player, Digital TV and Photo Copy Machine

**Summary**

In this lecture we learnt:

- What is a computer? How it is used in our daily life?
- Advantages of computer
- Basic computer terms, e.g., storage, output, input etc.
- Types of computer

# Computer Proficiency License (CS-001)

## Module 01

### Hardware

#### Objectives

The objective of this lesson is to provide information about:

- ✓ Computer hardware
- ✓ Computer components and parts
- ✓ Computer components and functions

#### Computer Hardware

Hardware refers to the physical elements of a computer. Examples of hardware in a computer are the keyboard, the monitor, the mouse and the processing unit

#### System Unit

It refers to the box that encapsulates the processor, motherboard, CD drives, hard drives,

#### Terms related to the system unit

Following are the terms for external parts of computer casing.

**Computer casing** is the box that houses the computer **Power** button is used to **switch on** the computer.

**Lights** shows the running status of the computer

**CD ROM** is the input device used to read data from CDs.

**USB Disk** is the A small, portable flash memory that plugs into a computer's USB port

#### Ports and Pin Sockets

It is an interface that links computer with other peripherals and monitor.

**Power Connector** is a socket used to supply power in computer

**Power cable** is used to supply power to monitor.

**USB Port** is a point of connection between a computer and other electronic devices such as webcam, scanner, printer, mouse and keyboard.

**Keyboard port** is a socket used to connect keyboard to the computer.

**Mouse port** is a socket used to connect a mouse to the computer.

**Serial port** is a socket on a computer that is used to connect scanner, mouse etc. It got 9pins.

**Parallel port** is a socket at the back of the computer to connect printer. It got 25 holes.

**Pin sockets** are used to connect speakers, microphone.

**Drive bay** is a place where hard drives are installed using screws

**Power supply** provides power to processors, mother board etc

**Mother board** holds together the central processing unit (CPU), memory and connectors for input and output devices.

**Processor** is a brain of computer and does all the processing.

**Fan** is used to cool down the processor to avoid it from being damaged

**RAM chip** is random access memory used by computer system to keep the running program here.

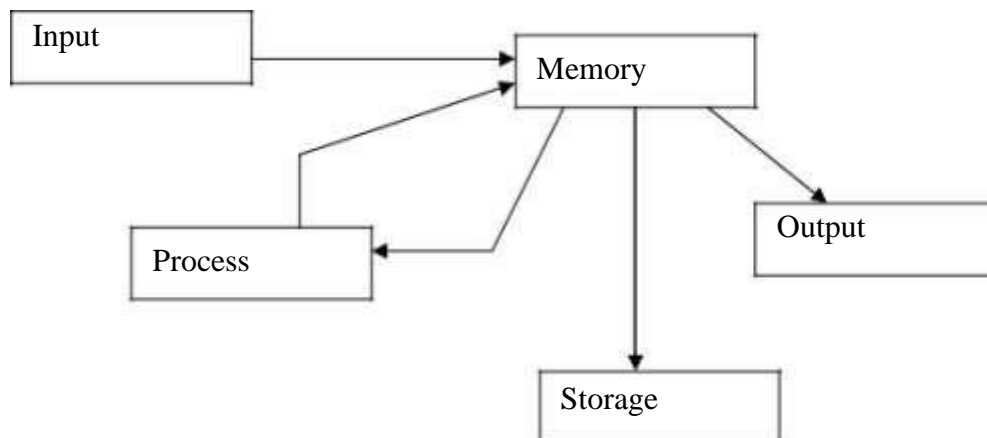
## Interface cards

Sound card is the interface used to produce sound via speakers

LAN card is used to develop a network (more than one computer connected to each other)

## How does computer works?

Following diagram explain how a computer works In a very generic form. Data goes into memory as input and from there it goes for processing. After processing it goes back to memory, from memory it is sent as output or it is stored.



## Summary

In this lesson we learnt information

- about: Various hardware
- components of computer
- System unit lights, buttons on it, front panel Ports such as serial ports, parallel ports,
- USB ports, Pin sockets



Drive Bay, Power supply, Motherboard, Card slots, RAM slots, Processor, Fan