Computer Application

Chapter 1:
Concepts of Information and Communication Technology

2024-2025

Why Studying Computer Application?

❑Students with Information and Communication Technology skills achieve an enriched educational experience, and they will be better prepared for life, work and further learning

❑Skilled employees enable organizations to use technology more effectively, leading to increases in productivity, while ensuring operational objectives are achieved more efficiently.

Course Content

This course consists of 5 chapters which define the skills and competencies necessary to be a proficient user of a computer and common computer applications:

① **Chapter 1:** Concepts of Information and Communication Technology (ICT)

② **Chapter 2:** Using the Computer and Managing Files

③ **Chapter 3:** Word Processing

④ **Chapter 4:** Presentation

⑤ **Chapter 5:** Spreadsheets

Chapter 1: Concepts of ICT

❑Chapter One or (Module 1) aimed to introduce you basics of Information and Communication Technologies (*ICT*) in terms of Computer, Computer *Hardware* and *Software*

❑This chapter will also introduce you to the uses of ICT in your daily lives, other things you learn is the safe way to store your information, and the laws of copyrights in ICT field

Computer Definition

➢ Computer is a programmable machine, or general-purpose electronic device that can be programmed to carry out a set of arithmetic or logical operations automatically. All computer Systems consists of two major elements: *hardware* and *software*
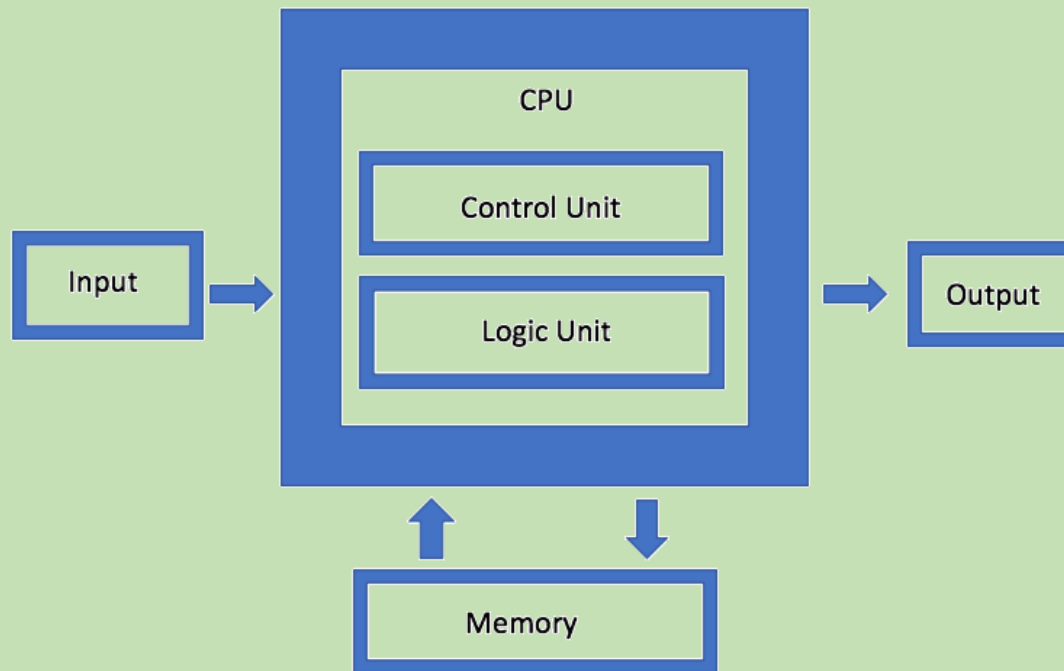
Von Neumann Architecture

Computer Types

Computers can be generally classified by *size* and *power* as follows:

① **Supercomputer:** An extremely fast computer that can perform hundreds of millions of instructions per second

② **Mainframe:** A powerful multi-user computer capable of supporting many hundreds or thousands of users simultaneously

③ **Minicomputer:** A multi-user computer capable of supporting up to hundreds of users simultaneously

④ **Workstation:** A powerful, single-user computer. A workstation is like a personal computer, but it has a more powerful microprocessor and, in general, a higher-quality monitor

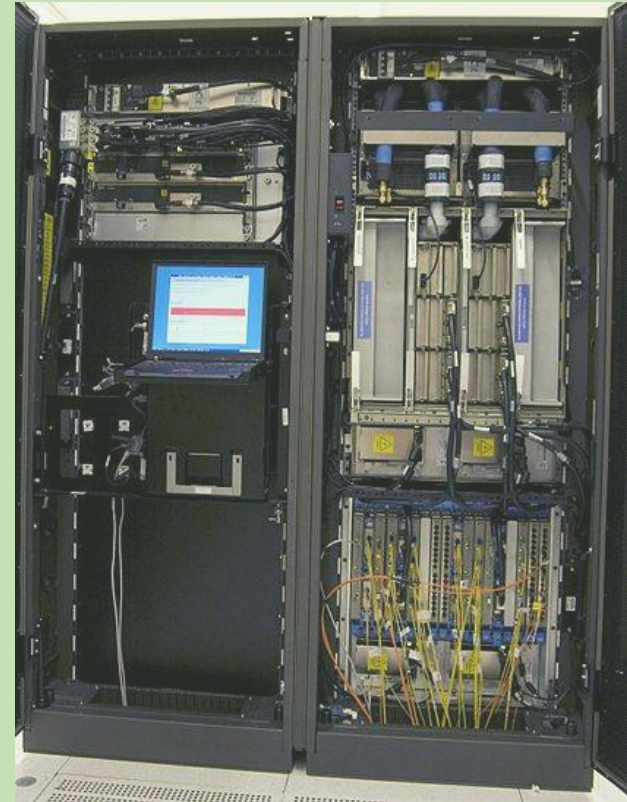⑤ **Personal computer:** A small, single-user computer based on a microprocessor

Supercomputer

❑ The largest, fastest, and more expensive type of computer

❑ Supercomputers are used by very large International companies, universities

❑ Use of it: weather forecasting, nuclear energy research, and petroleum exploration requires a supercomputer

❑ *An Example* is *Cray Supercomputer*

produced in US. The first Cray

Supercomputer was built in early

70s and costs around 8 million Dollars,

it process 160 million instructions

per second

Mainframe

❑ Smaller and slower than the super computers

❑ They are mostly used by large national companies such as banks and insurance companies

❑ The first company for manufacture Mainframe computers was IBM Company

Workstation

❑ A powerful single-user computer, Workstation is a special computer designed for technical or scientific applications.

❑ Intended primarily to be used by one person at a time

❑ Workstations were designed to terminate a different types of complex data such as 3D mechanical design, engineering simulation.

Personal Computer (PC)

❑ Personal Computer (PC) is a small, relatively inexpensive, multipurpose computer designed for an individual user

❑ Most popular use for personal computers is for word processing, accounting, running spreadsheet, database management applications and playing games

❑ The first Pc was invented in the year 1981 by

IBM company. these PCs called

"the original IBM PC"

Personal Computers Types (1)

Personal computers fall into several categories, differentiated mainly by their sizes:

① **Desktop Computers**

 It is consists of a large box called the system unit that contains most of the essential components

② **All in one Computers**

❑ All-in-one PCs, also known as all-in-one desktops, integrate the computer case and system components into the monitor so that the entire PC is contained all in one unit

❑ All-in-one (AIO) desktop PCs offer the advantage of a smaller form factor than desktop PCs, but they often come with several drawbacks as well, including higher cost, weaker performance and limited upgrade options

Personal Computers Types (2)

③ **Notebook or Laptop**

- ❑ Small PC with a built-in screen, keyboard, and pointing device, which substitutes for a mouse. Notebook can run most of the same software as a desktop, and similar to it in performance

- ❑ Notebooks can be carried and used any where, therefore it's a better choice for students and businessmen

④ **Tablets**

- ❑ A tablet is a portable computer that consists of a touch-sensitive screen mounted on a tablet-size plastic frame with a small computer inside

- ❑ Tablets are extremely portable and convenient, but usually do not run desktop computer applications and have limited memory and storage capabilities. Ipad and galaxy tab is a more famous examples for tablets
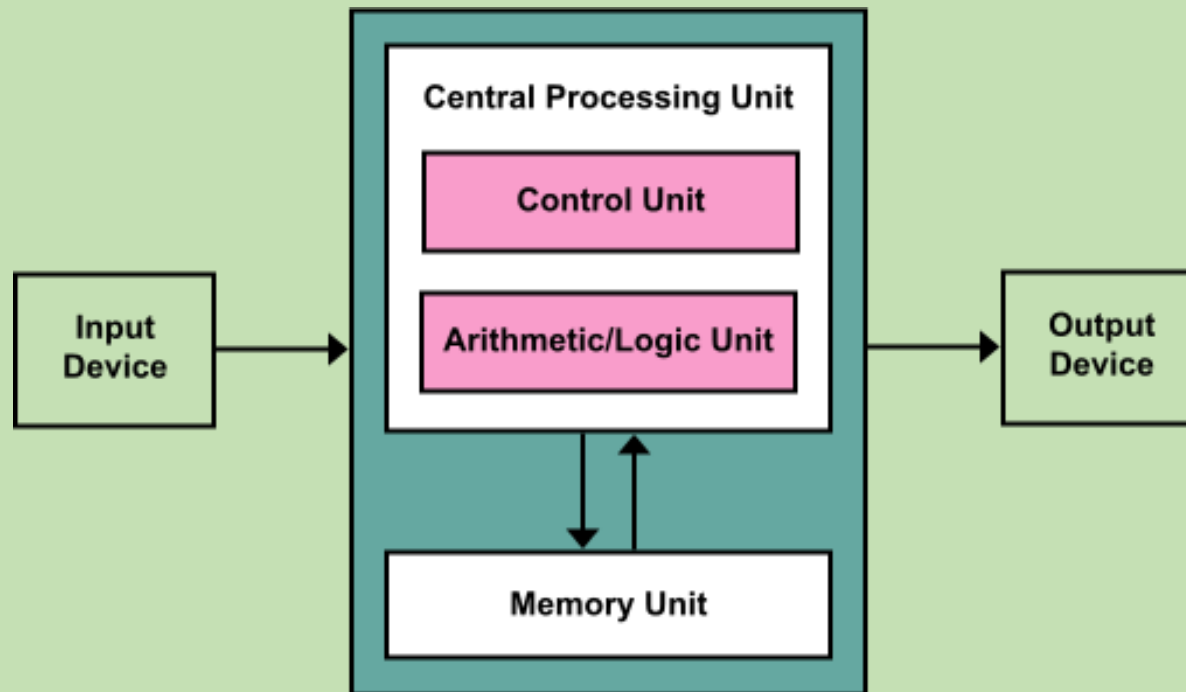
⑤ **Smart Phones**

A smart phone is a mobile phone that can run applications and has Internet capability

Main Parts of Computers

Computer systems include (*hardware* and *software*), computer Hardware generally consist of three parts:

Input Unit ➜ Process Unit ➜ Output Unit
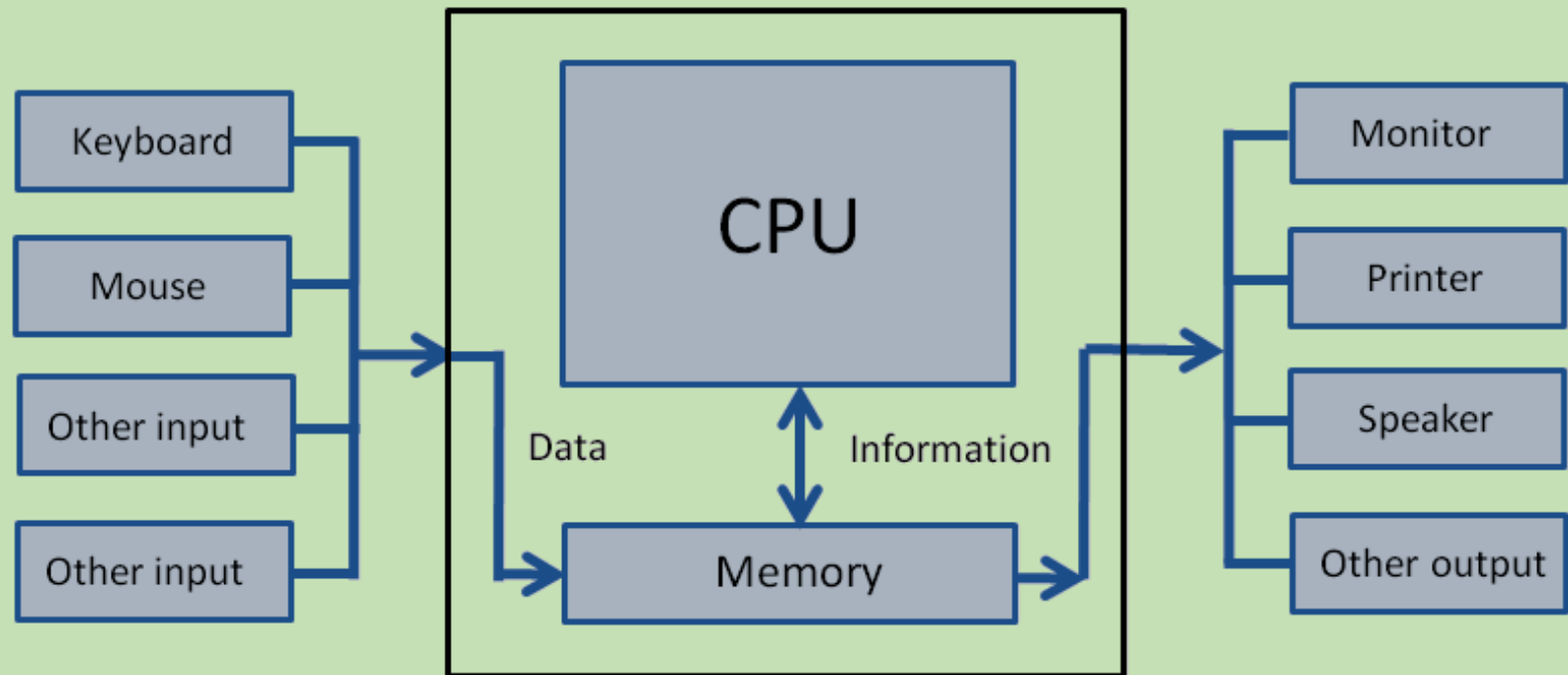
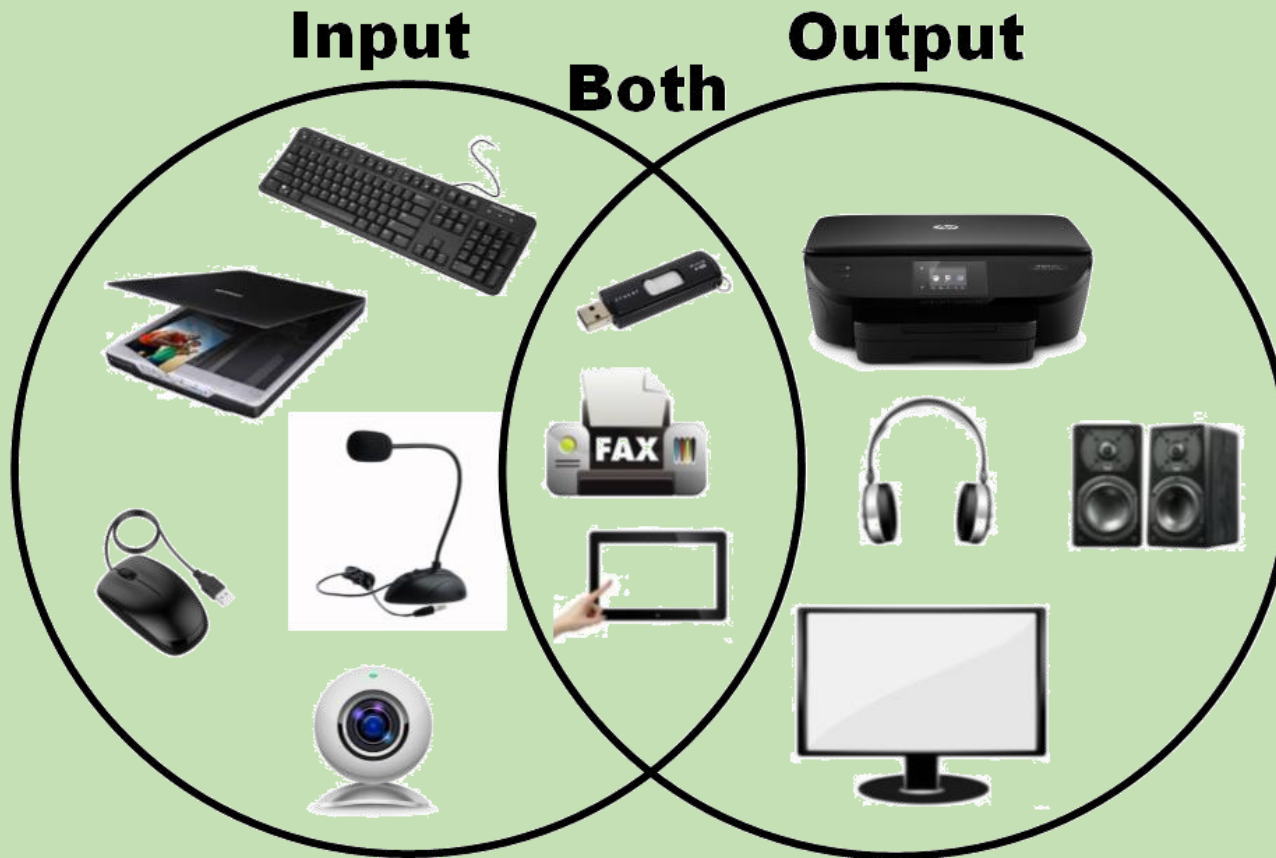# Main Parts of Computers (2)

Input Unit ➔ **Process Unit** ➔ **Output Unit**

Main Parts of Computers (3)

Parts Of Computer

COMPUTER CASE • MONITOR • SPEAKER • MOUSE • PRINTER • HARD DRIVE • RAM • MOTHERBOARD • PROCESSOR • KEYBOARD

# Main Parts of Computers (4)

➤ External Hardware Components

Computer Case

❑ *Computer Case* also known as a computer **Base Unit**, **Tower**, **System Unit**, or **Simply Case** is the enclosure that contains most of the components of a computer known as **Internal Hardware Components** (usually excluding the display, keyboard and mouse)

❑ Cases are usually constructed from steel or aluminum. Plastic is sometimes used, and other materials such as glass, wood

Central Processing Unit (CPU)

❑ It is the often referred to as the brain of the computer, which handles all instructions it receives from hardware and software running on the computer

❑ The CPU determine how fast your computer will run and is measured by its MHz speed

❑ Now the new CPU measured in GHz, which is actually the speed of the internal clock. A 3.0GHz clock means CPU can do 3 billion operation in a second

❑ **For example, there are two types of CPU:**

   ✓ *Intel Processor*

   ✓ *AMD Processor*
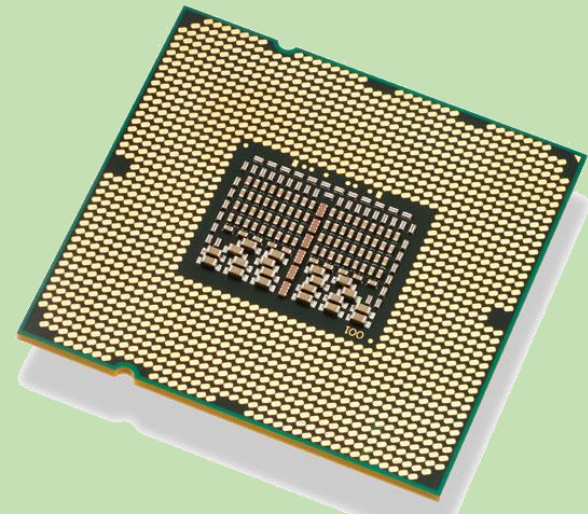
Motherboard

❑ A *motherboard* some times called (main board) is a printed circuit board that is the foundation of a computer, located at the bottom of the computer case

❑ It allocates power to the CPU, RAM, and all other computer hardware components. Most importantly, the motherboard allows hardware components to communicate with one another
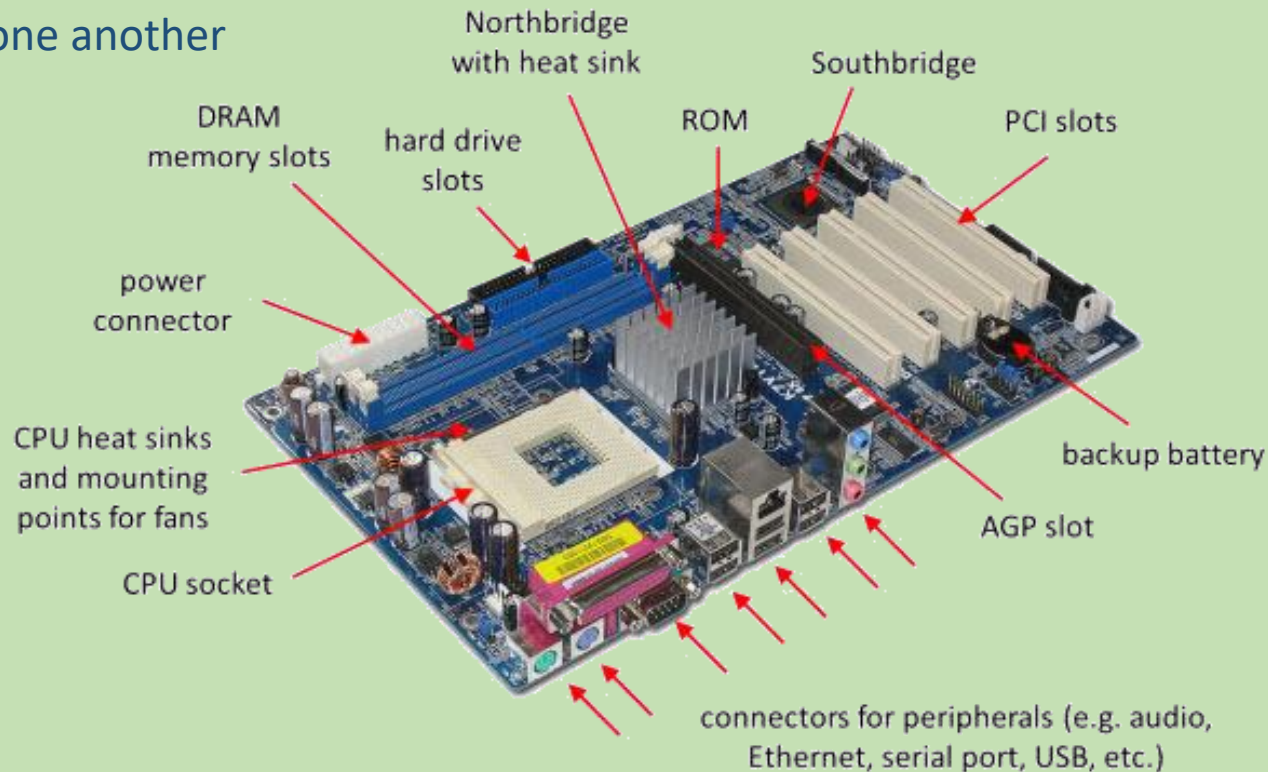
Controllers

❖Sound Card

- Internal component mounted to the motherboard.
- Provides input & output of audio signals from/to a computer under control of programs.
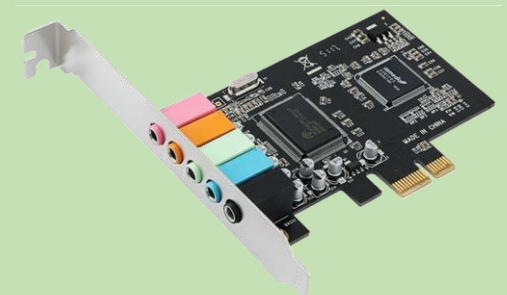
❖Network Interface Controller

- It is a circuit board installed in a computer that provides a dedicated network connection.
- NIC allows communications between computers connected via local area network (LAN).
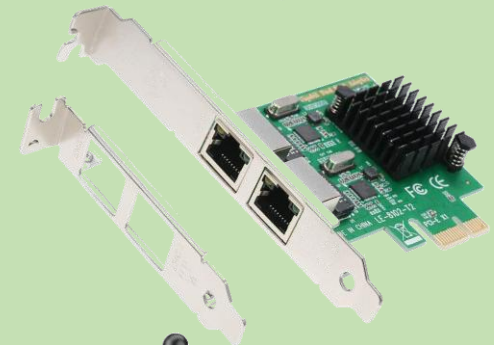
❖Wireless Network Adapter

- Wireless network card is inserted into the motherboard.
- No network cable is required to connect to the network.

Power Supply

❖Power Supply

- Converts alternating-current (AC) power coming
from a wall outlet into lower voltage direct-current (DC) power.
- DC power is required for all of computer components.

❖Heat Sink

- Used to transfer the temperature generated by CPU
to a fluid medium inside a sink.
- Then the fluid is cooled by a fan.

❖Case Fan

- Electronic components generate heat that may damage
or slow the computer.
- Case fan brings more air in the computer to remove that heat.

Storage Devices

A – Main Memory

① **RAM - Random Access Memory**

❑ The main 'working' memory used by the computer

❑ When the operating system loads from disk when you first switch on the computer, it is copied into **RAM**

❑ **RAM** is a volatile memory and requires power to keep the data accessible. If the computer is turned off, all data contained in RAM is lost

❑ Measured by MB or GB. Such as 256 MB , 512 MB , 1GB, 2GB, 4GB

② **ROM – Read Only Memory**

❑ Read Only Memory (ROM) as the name suggests is a special type of memory chip in a computer and other devices that holds software that can be read only

❑ A good example is the ROM-BIOS chip, which contains read only software

Storage Devices (2)

B – Auxiliary Memory

Hard Disk

Speed: Very Fast

Capacity : 8GB,120GB,160GB,250GB

CD

Speed: Fast

Capacity 750 MB

DVD

Speed: Very Fast

Capacity : 4.7GB

Flash Disk

Speed: Very Fast

Capacity :2,4,8,16,32 GB

Floppy Disk

Speed: Slow

Capacity : 1.44 MB

Storage Devices (3)

C – Cloud Storage

Cloud storage means "*the storage of data online in the cloud,*" These cloud storage providers are responsible for keeping the data available and accessible, and the physical environment protected and running. People and organizations buy or lease storage capacity from the providers to store user, organization, or application data
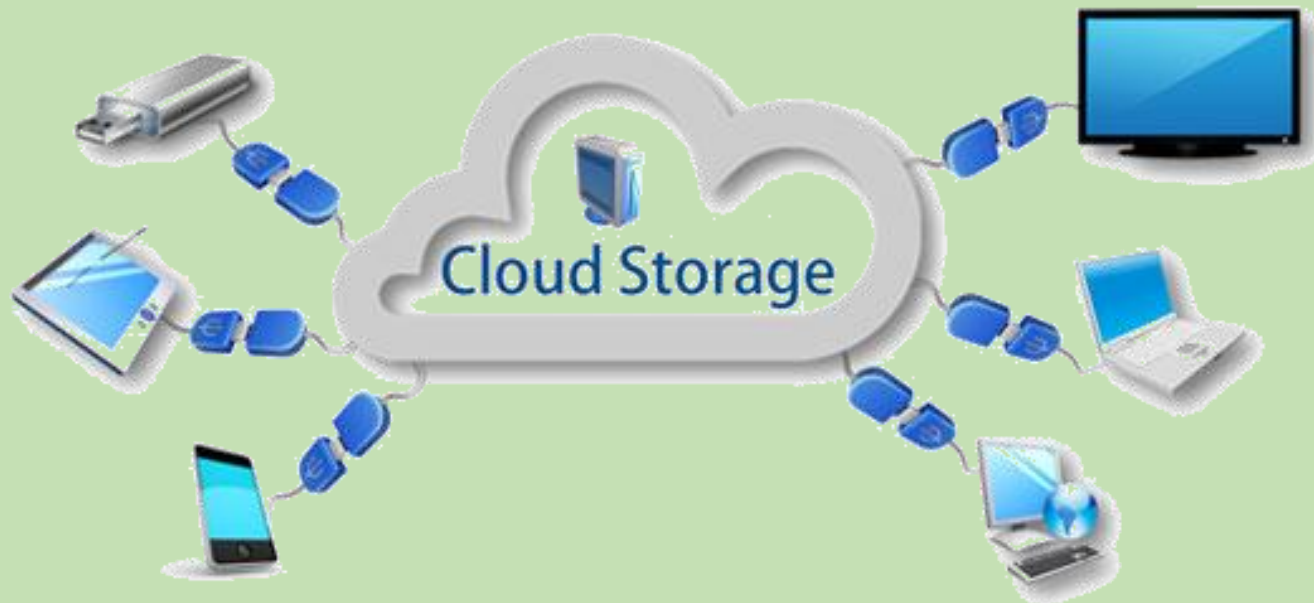
Cloud Storage

Storage Devices (4)

Advantages of Cloud Storage

❑ There are many benefits to using cloud storage, most notable is file accessibility

❑ Files stored in the cloud can be accessed at any time from any place so long as you have Internet access

❑ Another benefit is that cloud storage provides organizations with off-site (remote) backups of data which reduces costs associated with disaster recovery

Disadvantages of Cloud Storage

❑ Unfortunately, the biggest disadvantage to cloud storage is that users are limited by bandwidth

❑ If your Internet connection is slow or unstable, you might have problems accessing or sharing your files

❑ Organizations that require a large amount of storage may also find costs increase significantly after the first few gigabytes of data stored

Hard Drive

❖Consists of several hard disks, magnetic heads to read/write,

a drive motor to spin the disks, and a small amount of circuitry.

- A magnetic head writes a binary digit (1 or 0) by magnetizing

tiny spots on the spinning disk in different directions and

reads digits by detecting the magnetization direction of the spots.

Graphics Processing Unit

- Integrated GPU is embedded alongside the CPU.

- GPU is used in graphics and video rendering.

- GPU is built to process graphics information including

image's geometry, color, shading, and textures.

- Its RAM is also specialized to hold a large amount of

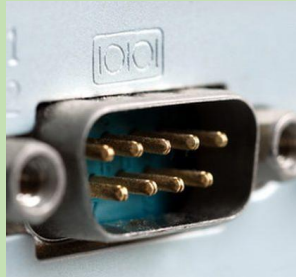information coming into the GPU and video data to the screen.
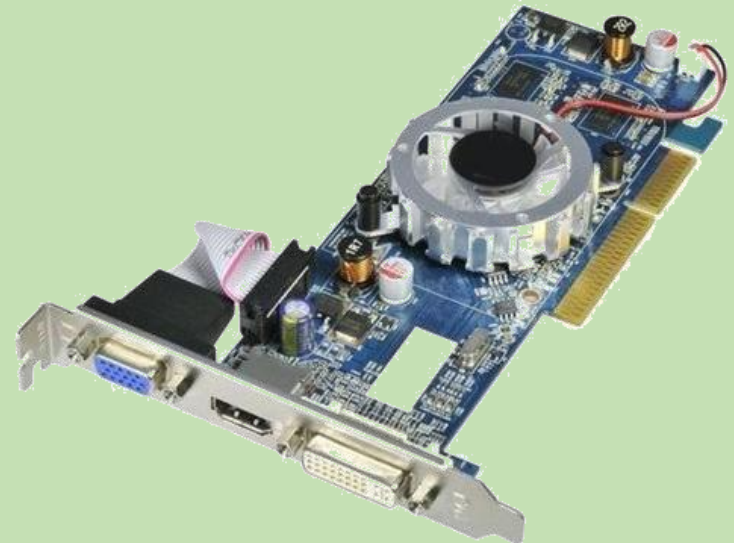
Ports

Input/output ports on a computer used to connect peripheral devices, such as printers, scanners, and portable drives.

USB Port

Serial Port

PS/2 Ports

SCSI Ports

Memory Measurement Unit

Computer only understands the **binary language**. The information stored in the computer is in the form of 0`s and 1`s called bits

What is a bit (Binary Digit)?

A bit is the smallest unit of the data/information. a bit can have only a single value either 0 or 1.a group of 8-bits makes 1 Byte

8 bits	= 1 Byte
1024 Bytes	= 1 KiloByte
1024 KiloBytes	= 1 MegaByte
1024 MegaBytes	= 1 GigaByte
1024 GigaBytes	= 1 TeraByte
1024 TeraBytes	= 1 PetaByte
1024 PetaByte	= 1 ExaByte

Computer Software

➢**What is a Software?**

✓Software is a set of instructions or programs instructing a computer to do specific tasks.

✓Software is often used to describe all the functional aspects of a computer that do not refer to its physical components (hardware).

✓Scripts, applications,

✓programs and a set of

instructions are all terms

often used to describe software.
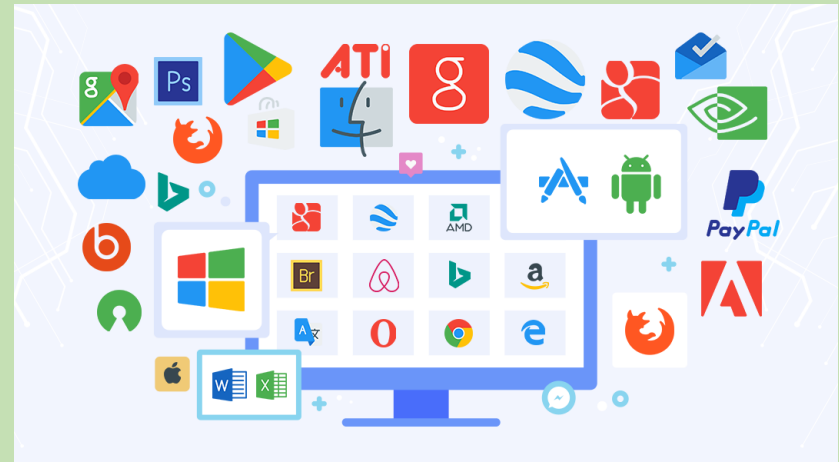
Computer Software (2)

➢**Software Categories**

❖**Operating System:** codes and set of instructions that manage the computer's memory and processes, as well as all of its software and hardware.

❖**Programming Languages:** A programming language is a computer language programmers use to develop software programs, scripts, or other sets of instructions for computers to execute.

❖**Application Software:** end-user programs that deal with user inputs and in order to complete a specific task.

Computer Software (3)

➢**Operating System Functions**

✓Booting up.

✓Provides user interface.

✓Controls hardware access.

✓Manages files and folders.

✓Manages memory and applications.

✓Maintains security and access rights of users
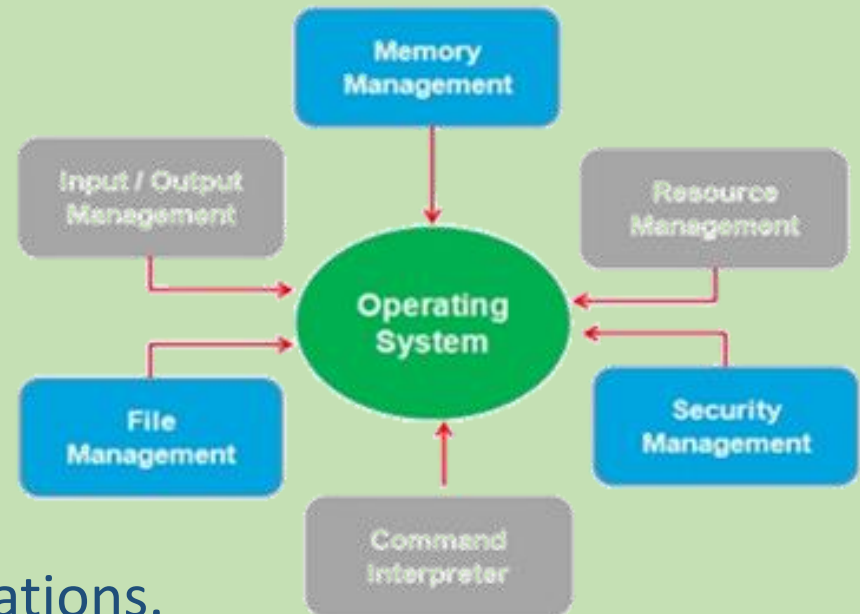
Computer Software (4)

➢**Operating System Features**

✓**Multi-user:** Two or more users can work with programs and share peripheral devices, such as printers, at the same time.

✓**Multi-tasking:** The computer is capable of operating multiple applications at the same time.

✓**Multi-processing**: The computer can have two or more central processing units (CPUs) that programs share.

ICT Applications

ICT has become an essential part of our life, we use it everyday in industry, the service sector, transport, logistics, health care, housing, education, and our leisure time, almost without our noticing it. the main topics in this field are:

- ❑ Communication
- ❑ Transportation
- ❑ Health
- ❑ Education
- ❑ Banking
- ❑ Social Networks
- ❑ Crime and Policing

Healthy Use of Computers

❑ Spending a lot of time behind a computer screen can be unhealthy, this can cause a strain in the eyes, and make another health problems that we can avoid by:

① **Use moving chairs that turns around and can be adjusted**

② **Adjust your chair and desk such that your screen is either at your eye level or lower**

③ **Take mini breaks from work and stretch a bit or go for a short walk every 30 min**

④ **Maintain a proper distance from the screen. Look away from the screen intermittently. Don't forget to blink**

Information Security

❑ Information security is not a single technology; rather it a strategy comprised of the processes, tools and policies necessary to prevent, detect, document and counter threats to digital and non-digital information

❑ Information security involve both physical and digital security measures to protect data from unauthorized access, use, replication or destruction.

❑ **Basic Steps for better Information Security:**

✓ Use original Software with Security Updates

✓ Using Antivirus and Internet Security

✓ Protecting Mobile Devices

✓ Keeping Self Awareness for Information Security

✓ Handling User Accounts and Passwords

✓ Using Webmail Wisely

✓ Use Public Computers Carefully

✓ Safe Online Social Networking

✓ Protecting Against Spam Emails