WELCOME
TO
CSE DEPARTMENT

CONGRATULATIONS!!

Overview of The Course

- Introduction to Computer Systems (CSE 1110)
- Course Credit: 1.0
- Lecturer Shekh. Md. Saifur Rahman

Objective of the Course

To gain an overview of Computer systems and learn basic computer programming

Introduction to computer

Computer

- Computer is an electronic device that stores, retrieves, and processes data.
- It takes data as input, process it and then give information as output.
- Processed data is called information.
- Input is processed, produce output – this is directed by the software but performed by the hardware.

Characterstics of Computer

1. **Automatic**
   - ❖ Computer is an automatic machine.
   - ❖ Once a program is given to computer i.e. stored in computer memory, the program and instruction can control the program execution without human interaction.

2. **High Speed**
   - ❖ Computer is a very fast device. It is capable of performing calculation of very large amount of data.
   - ❖ The computer has units of speed in microsecond, nanosecond, and even the picosecond.
   - ❖ It can perform several billions (10^9) , even trillions (10^{12}) simple arithmetic calculations in a second

Characterstics of Computer

3. Accuracy

- The calculations are 100% error free.
- Computers perform all jobs with 100% accuracy provided that correct input has been given.

4. Diligence

- Unlike human beings, a computer is free from **monotony, tiredness and lack of concentration**.
- It can work continuously without any error and boredom.
- It can do **repeated** work with **same speed** and **accuracy**.

Continue..

Characterstics of Computer

5. Versatility

- A computer is a very versatile machine.
- A computer is very flexible in performing the jobs to be done.
- This machine can be used to solve the problems related to various fields.
- At one instance, it may be solving a complex scientific problem and the very next moment it may be playing a card game.

6. Power of Remembering

- Memory is a very important characteristic of computers.
- A computer has much more storage capacity than human beings.
- It can store large amount of data.
- It can store any type of data such as images, videos, text, audio and many others.

Continue..

Characterstics of Computer

7. No I.Q

- A computer is a machine that has no intelligence to perform any task.
- Each instruction has to be given to computer.
- A computer cannot take any decision on its own.

8. No Feeling

- Computers have no feelings or emotions.
- It cannot make judgment based on feeling, taste, experience, and knowledge unlike a human being.

Evolution of Computer

First Generation

1946-1959. Vacuum tube based. ENIAC, IBM 701

Second Generation

1959-1965. Transistor based. Honeywell 400, IBM 7030

Third Generation

1965-1971. Integrated Circuit based. IBM 360/370, CDC 6000

Fourth Generation

1971-1980. VLSI microprocessor based. CRAY-1(Super Computer), CRAY-X-MP(Super Computer), DEC 10

Fifth Generation

1980-onwards. ULSI microprocessor based Desktop, Laptop

Introduction to computer Types

1. PC (Personal Computer)

It is a single user computer system having moderately powerful microprocessor

Continue..

2. WorkStation

It is also a single user computer system which is similar to personal computer but have more powerful microprocessor.

Continue..

3. Notebook Computer

Small in size. Used by individual users.

Continue..

4. Tablet Computer

Small in size. Used by individual users.

It has all notebook's functionality but lighter than notebook.

Accept input from a stylus or digital pen.

Continue..

5. Handheld Computer

Small enough to fit in your hand.

Popular handheld computer is PDA (Personal Digital Assitant).

Not lager than a small appointment book

Continue..

6. Smart Phone

Some cellular phones doubled as miniature PCs

Offers advanced features

Continue..

Introduction to computer Types

In terms of sizes

1. Super Computer

- It is an extremely fast computer which can execute hundreds of millions of instructions per second.
- Most powerful in terms of data processing and performance.

Continue..

2. Main Frame

- Not as powerful as supercomputer
- Mainframes can also process & store large amount of data
- Used in large organization

Continue..

3. Minicomputer

- Used for specific purposes
- **“Midrange Computers”**
- Individual departments of a large company or organizations

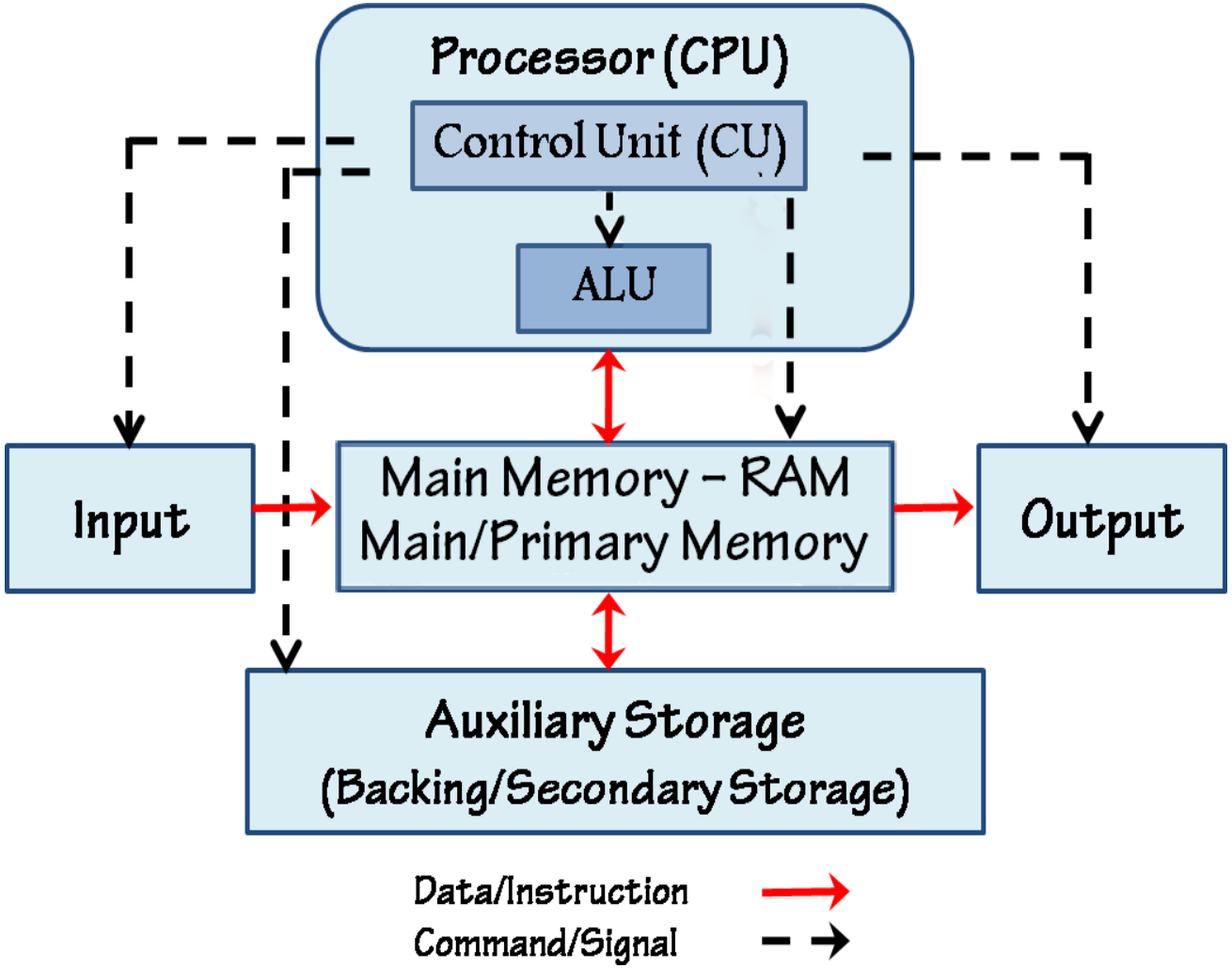
Introduction to computer Types

4. Microcomputer

- Desktop , laptops, personal digital assistant (PDA), tablets & smart phones
- Widely used & the fastest growing computers

Basic Functions of Computer

1. Inputting
2. Storing
3. Processing
4. Outputting
5. Controlling



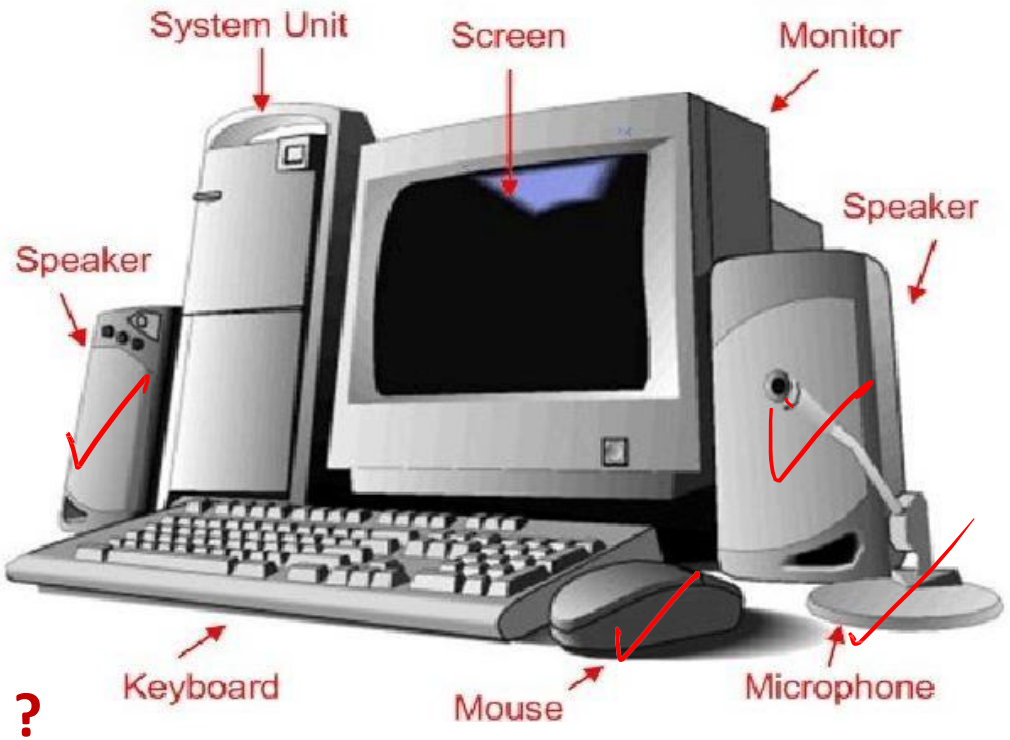
Parts of Computer System

- Computer system has four parts . This parts combindly create computer system.
  - Hardware
  - Software
  - Data
  - User

Hardware

- Physical equipment that performs basic function of data processing.
- We can see or touch the parts of hardware.

- It consists of ---
  - CPU (Center processing Unit)
  - Memory unit
  - Input devices
  - Output devices
  - Secondary storage devices

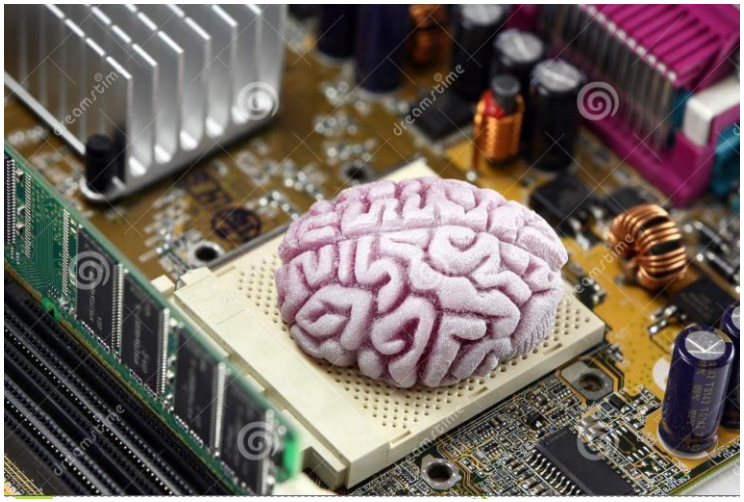


➢ **But where is the SOFTWARE ?**

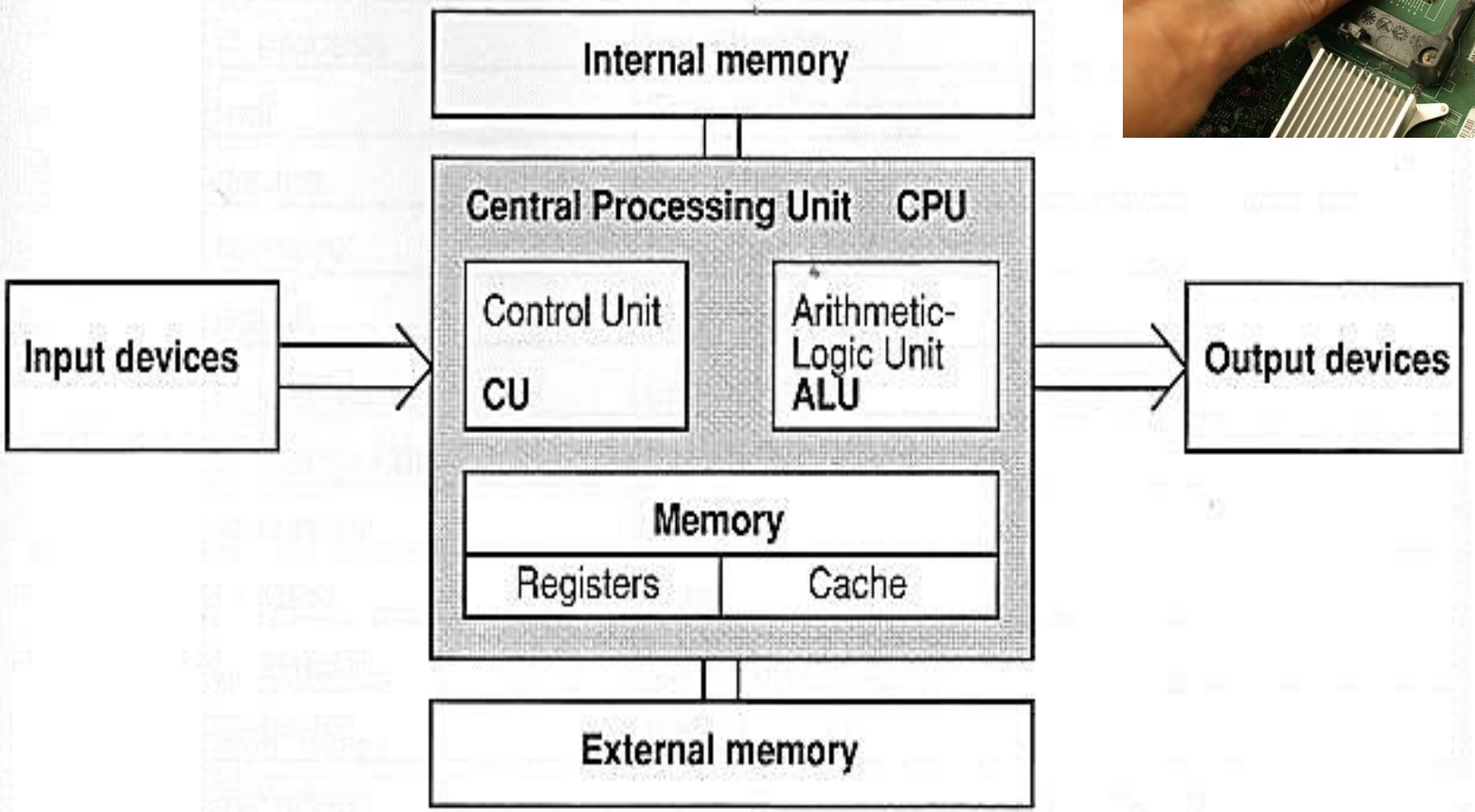
CPU – Central Processing Unit

CPU consists of the following **features**:

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



CPU


Internal memory
Central Processing Unit CPU
Control Unit
CU
Arithmetic-
Logic Unit
ALU
Input devices
Output devices
Memory
Registers
Cache
External memory

Memory

- Memory is used to store data and instructions
- Computer memory is the storage space in computer where data is to be processed and instructions required for processing are stored

Memory is primarily of three types

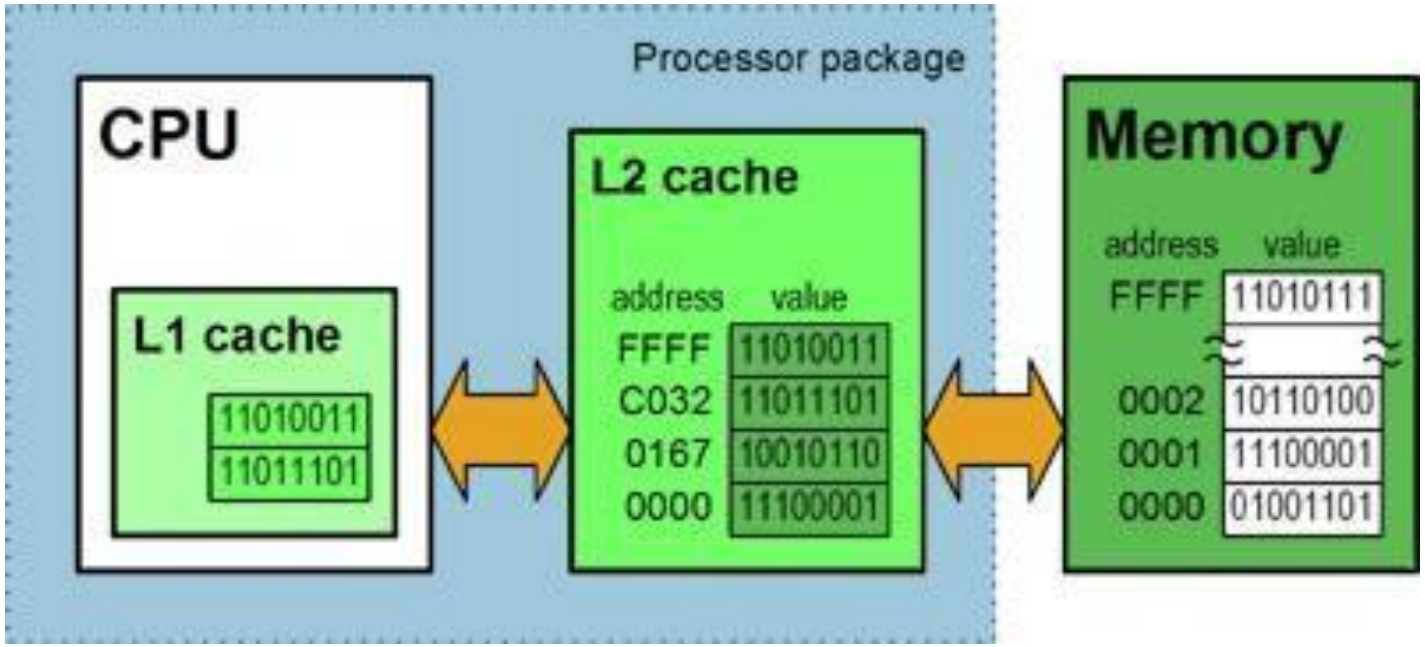
-- Cache Memory

-- Primary Memory/Main Memory

-- Secondary Memory

Cache Memory

- Cache memory is a very high speed semiconductor memory which can speed up CPU.
- It acts as a buffer between the CPU and main memory



Memory

Primary Memory (Main Memory)

- Primary memory holds only those data and instructions on which computer is currently working
- It is divided into two subcategories RAM and ROM

Memory

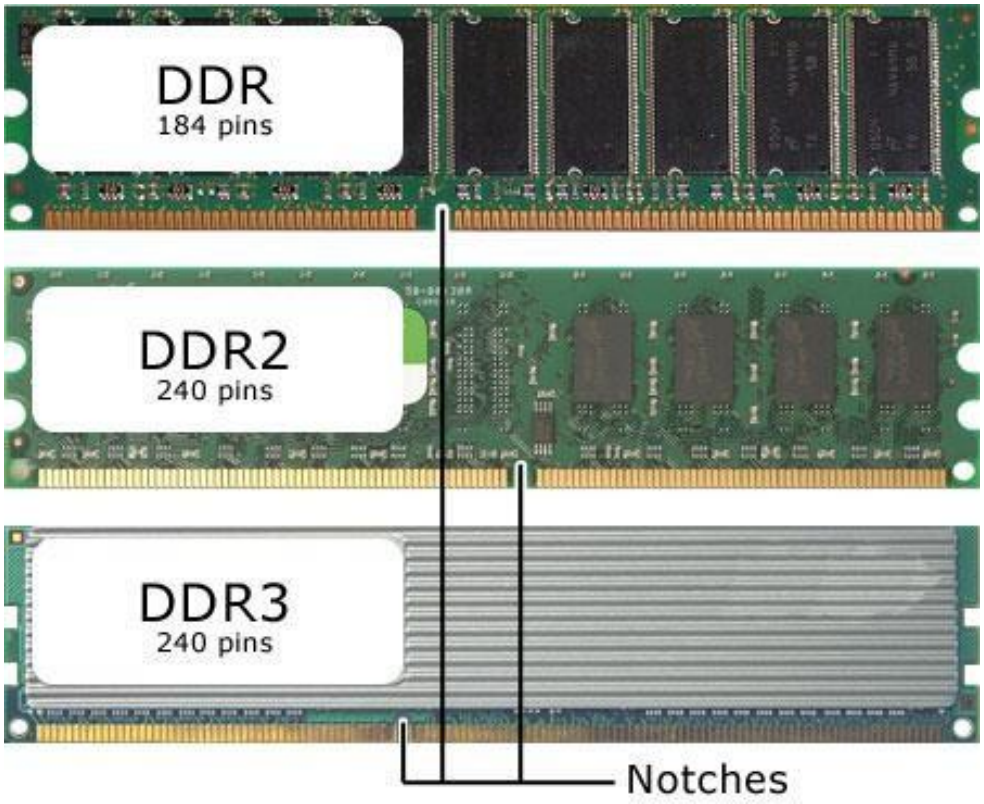
RAM (Random Access Memory)

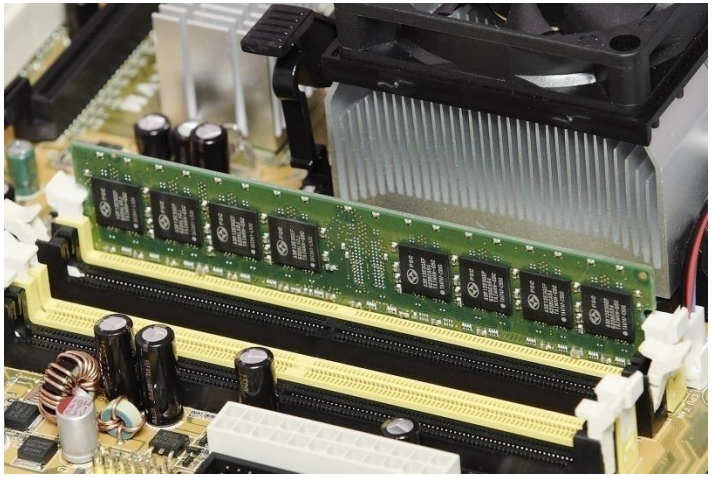
- RAM(Random Access Memory) is the internal memory of the CPU for storing data, program and program result.
- Volatile

- It has two types—
  - Static RAM
  - Dynamic RAM

Memory

RAM (Random Access Memory)





Memory

Read Only Memory (ROM)

- The memory from which we can only read but cannot write on it.
- Non-volatile.
- Information is stored permanently during manufacture

Memory

Secondary Memory

- Also known as external memory or non-volatile.
- Slower than main memory.
- Used for storing data/information permanently

Floppy Drive

Secondary Memory

Hard Disk or Drive

Memory

Hard Disk Drive or Hard Disk

- Made of rigid materials unlike floppy disks
- Holds a greater amount of data
  - 10MB in 1980s
  - 600MB in mid 1990s
  - 4.3GB in 1999
  - 180GB in 2001
  - 400GB - 2004

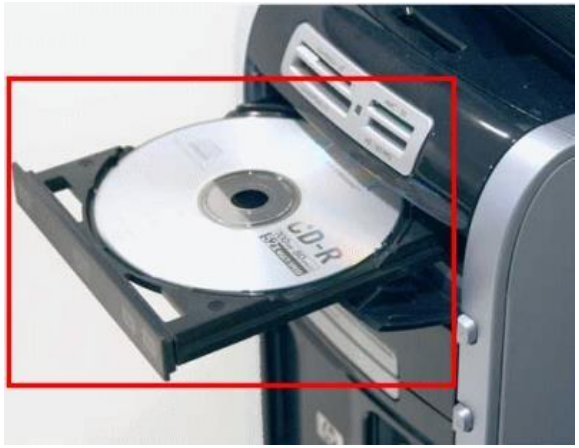
- Hard disk is a higher capacity drive.
- It also stores the operating system which runs when we turn on the computer.
- Non-volatile
- Stores data in magnetic disk
  - Speed: very fast, measured in milliseconds.
  - The smaller this number faster the disk.
  - Capacity: enormous.
  - Cost: cheap

Optical Drives

- CD-ROM — read CDs
- CD-Writer — read/write CDs
- DVD-Combo — read/write CDs, read DVD
- DVD Writer — read/write CDs
  read/write DVDs

Secondary Memory

Optical Drive.. CD, DVD

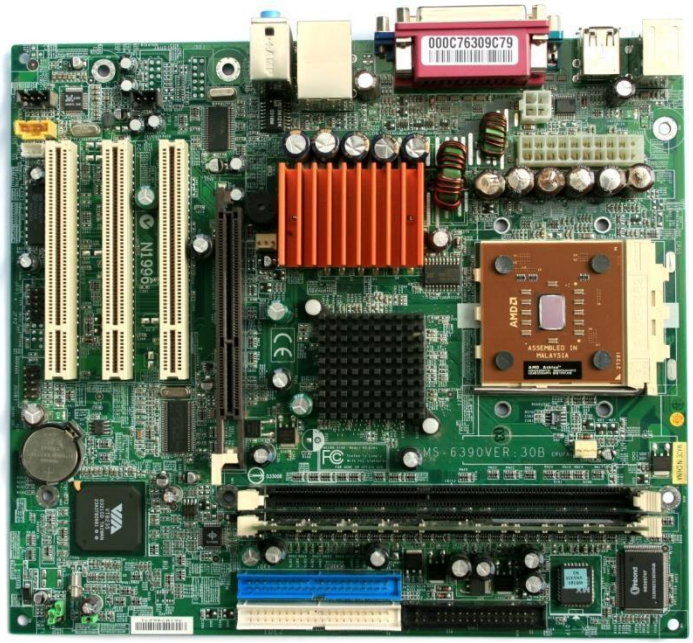


Secondary Memory

Flush/Pen Drive

Motherboard

- Serves as a single platform to connect all of the parts of a computer together.
- 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.



PCI SLOTS

- **PCI slots** This board has 4 slots for the newer PCI boards for peripherals like video cards, sound cards, internal modems, etc

MEMORY SLOT

- **Memory slots**
  There are 4 short slots for SIMM memory.
  This board has two long slots for a new kind of memory called DIMM DRAM.

Motherboard

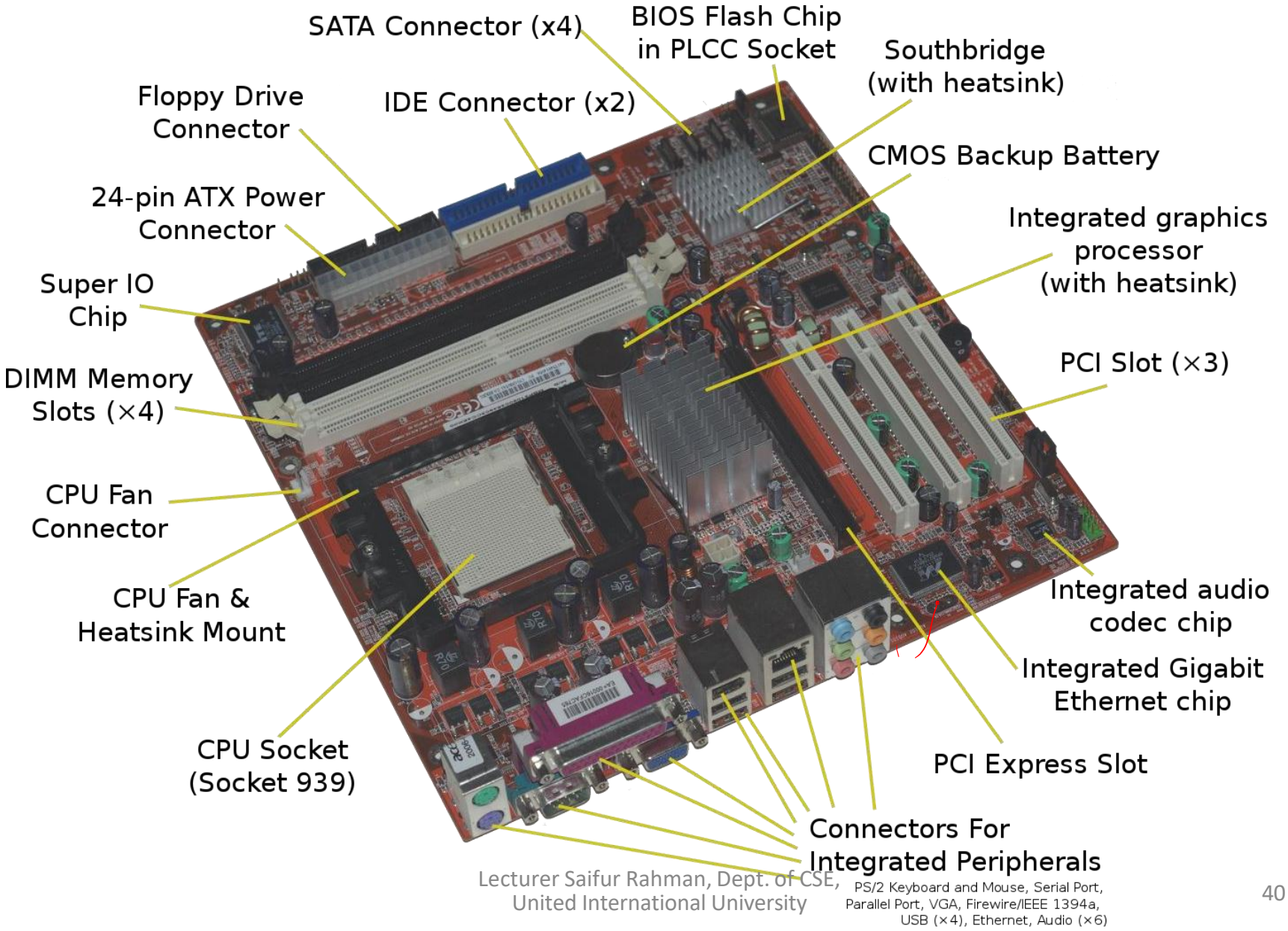
Keyboard plug :This is where the keyboard attaches, thru the back of the computer.

Power Connections This is where the power supply connects to the motherboard

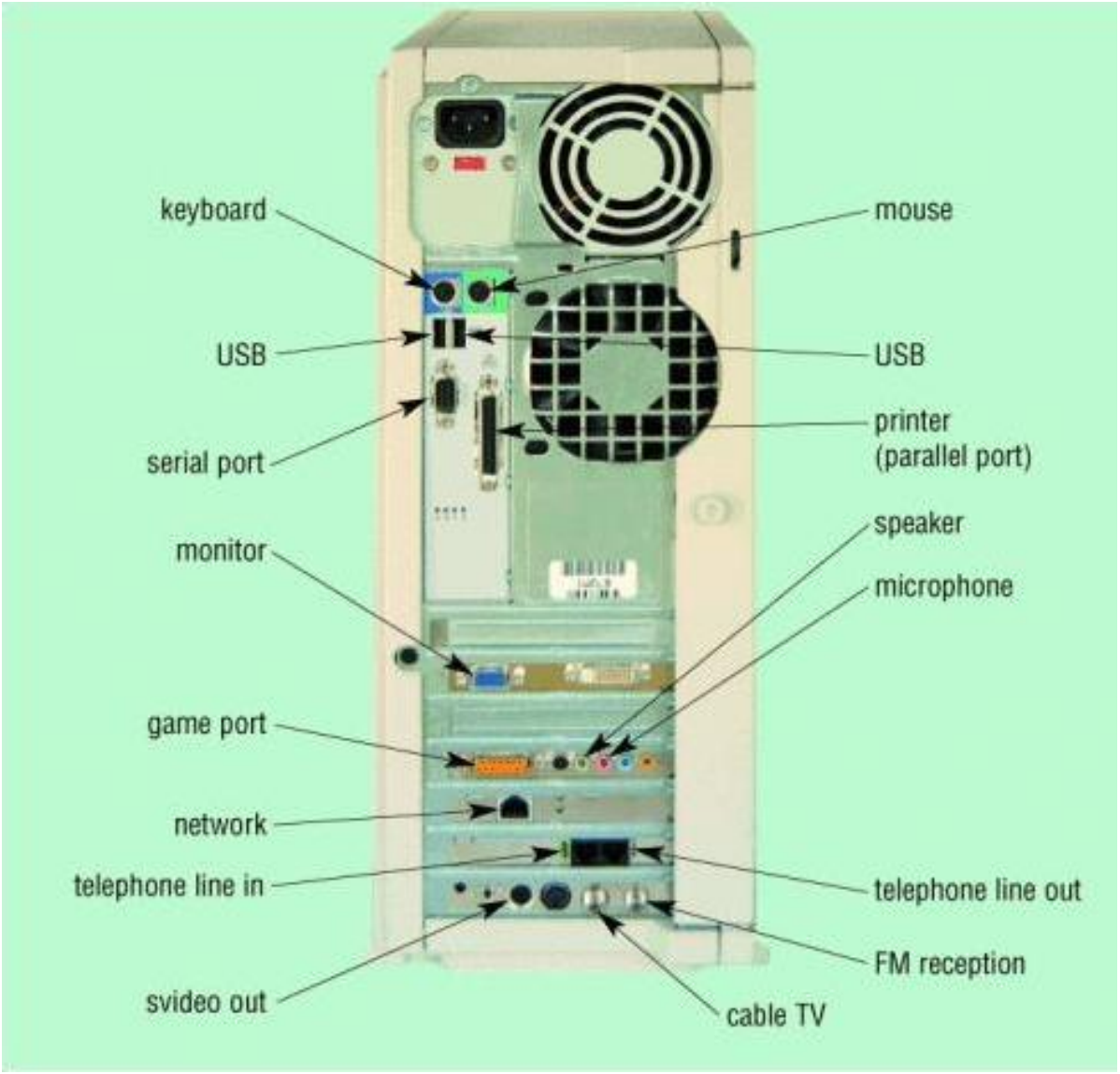
Processor socket What is visible here is the place where the processor plugs into the motherboard. When the processor is installed, you still can't see it because on top of it is a heat sink and fan to keep the processor cool. Hot processors make mistakes or even melt important parts on the chip.

Different processors are different sizes. So the socket on the motherboard has to match the processor. Also, the circuits in the motherboard itself must be different for different processors.

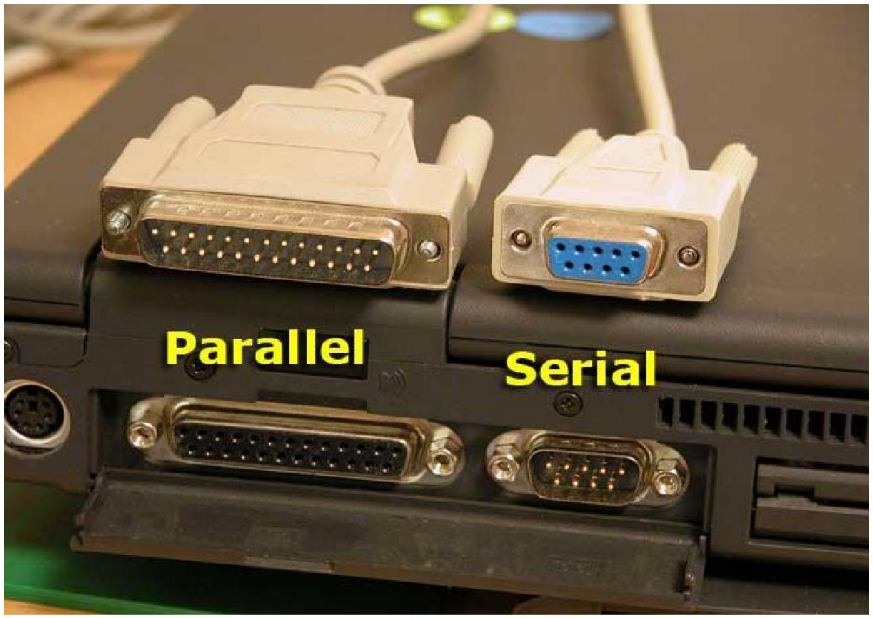
Motherboard

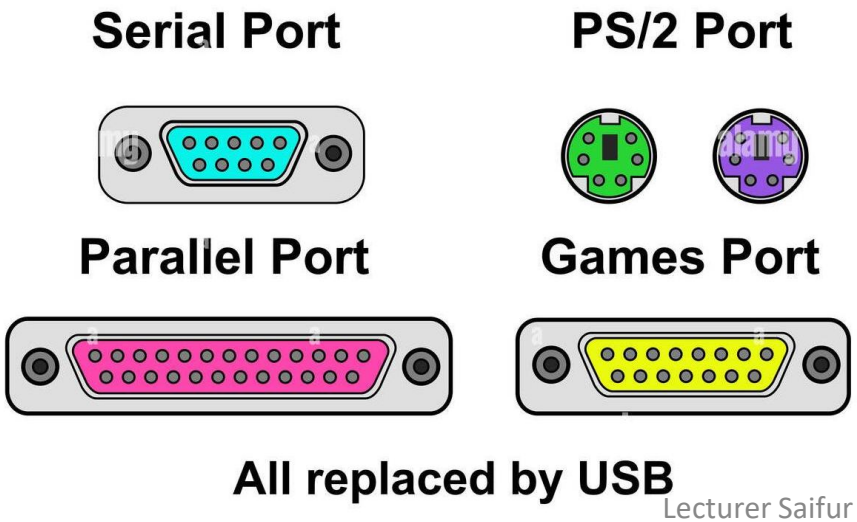


Motherboard



- Ports are sockets that allow you to plug in device connectors to access the common electrical bus on the motherboard.
- Ports are usually found on the back of the system unit, but newer styles also have some of them conveniently located on the front.
- Ports allow specific types of connectors (which partly reflects changing technology as well as various kinds of technology).





Types of Ports

- Serial ports transmit data one bit at a time, like the picture on the left illustrates.
- Parallel ports transmit more than one byte at a time.
- These types of port designs are based on whether or not fast data transmission rates are required by the device or not.
- Most computers come with basic types of ports (serial, parallel, keyboard, mouse, and USB); and expansion cards allow you to expand the available types needed by specific devices.

Motherboard

- Expansion slots are sockets to provide direct connections to the common electrical bus, allowing you to insert a circuit board into the motherboard.
- Typical Expansion Cards:
  - Video Cards
  - Sound Cards
  - Modem Cards
  - Network Interface Cards (NIC)
- Laptops and portable computers typically have PC Cards – thin credit-card sized devices used to add memory, disk drives, etc.

Input Devices

- Allows data and programs to be sent to the CPU.
  - Keyboard
  - Mouse
  - Joystick
  - Microphone
  - Webcam
  - Scanner
  - Monitor

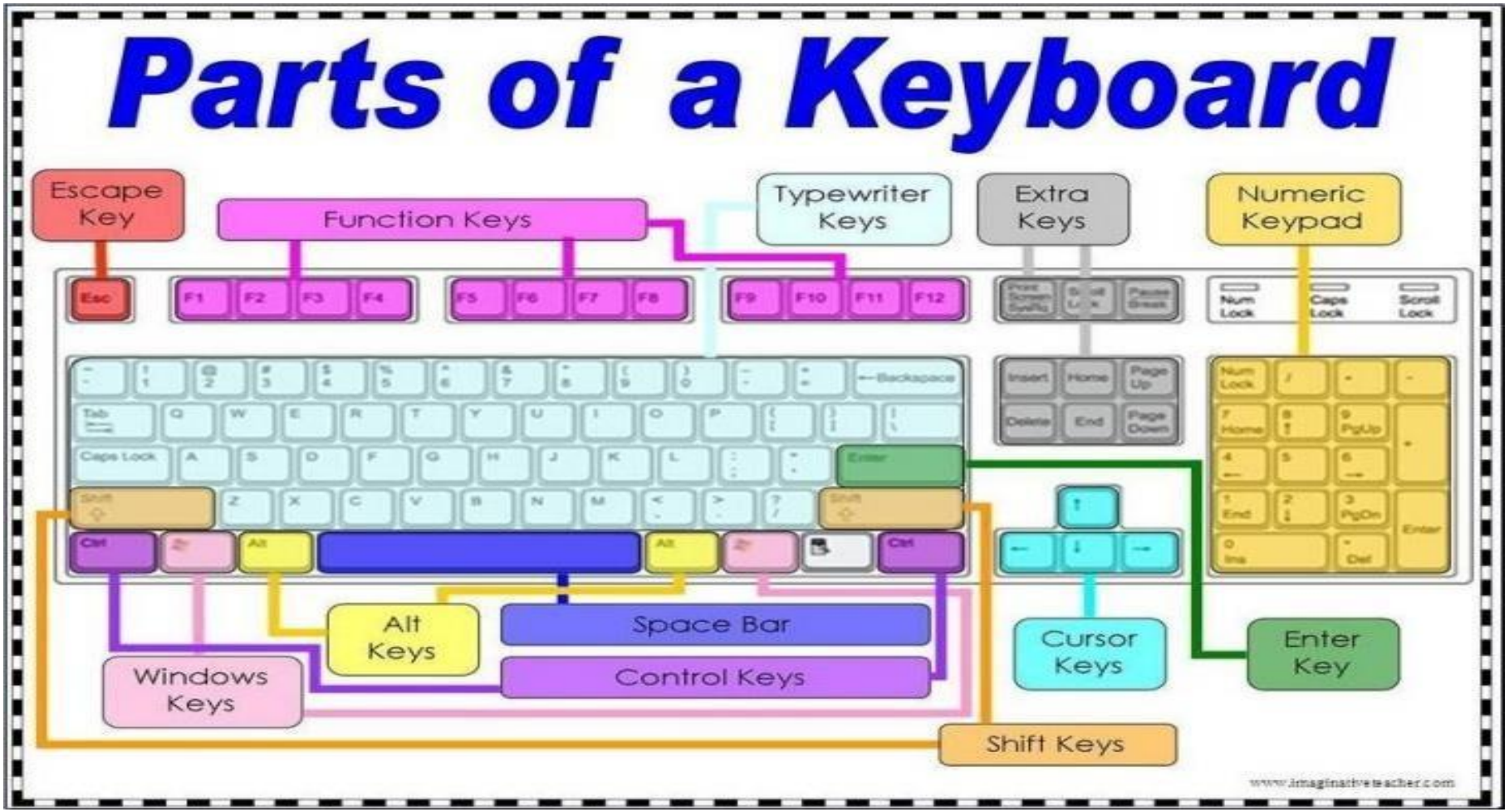
Input Devices

Keyboard

- Traditional keyboards
- Flexible keyboards
- Ergonomic keyboards
- Wireless keyboards
- PDA keyboards

Input Devices

Keyboard



Mouse

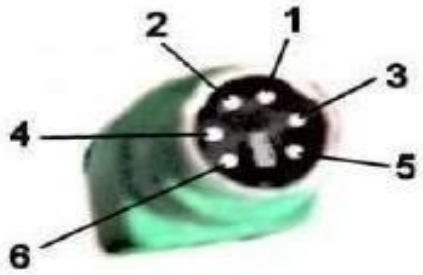
Two Types of Mouse

- **Mechanical** - a type of computer mouse that has a rubber or metal ball on its underside and it can roll in every direction.
- **Optical:** This type uses a laser for detecting the mouse's movement.

Mouse

How a Mouse Hooks Up to a PC

- PS/2 Mouse



- Serial Mouse
- USB/Cordless Mouse

Input Devices

- Joystick – input device for computer games

- Light Pens – light-sensitive penlike device

- Stylus – penlike device commonly used with tablet PCs and PDAs.

Output Devices

Monitor

Types of Monitor

- Cathode Ray Tube (CRT)

- Liquid Crystal Display (LCD)

Output Devices

Printers

- IMPACT PRINTERS uses pressure by physically striking the paper. Ex. Daisy wheel printers, line printers, dot matrix printers & band printers.
- NON-IMPACT PRINTER does not apply pressure on the paper but instead produces character by using lasers, ink spray, photography or heat.

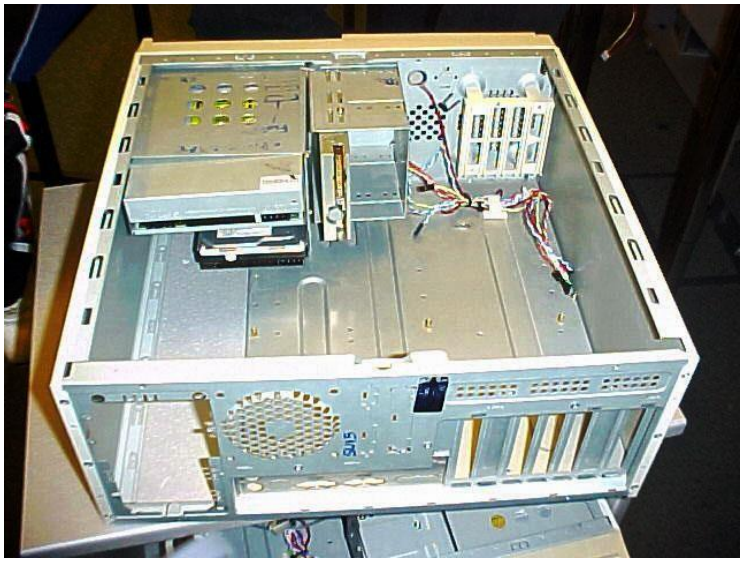
Output Devices

Dot matrix printer

Laser printer

Inkjet printer

Casing or Cover



Casing or cover

- The box or outer shell that houses most of the computer, it is usually one of the most overlooked parts of the PC.
- Protects the computer circuits, cooling and system organization.

Power Supply

- Responsible for powering every device in your computer.
- Parts of a Power supply:
  - Disk drive connectors
  - Motherboard connector
  - Power supply fan
  - Power switch
  - Input voltage selector
  - Cover
  - Power plugs receptacle