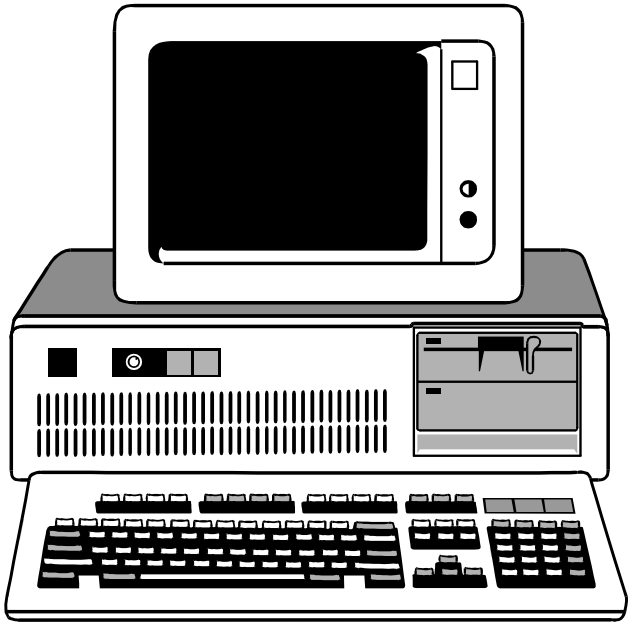
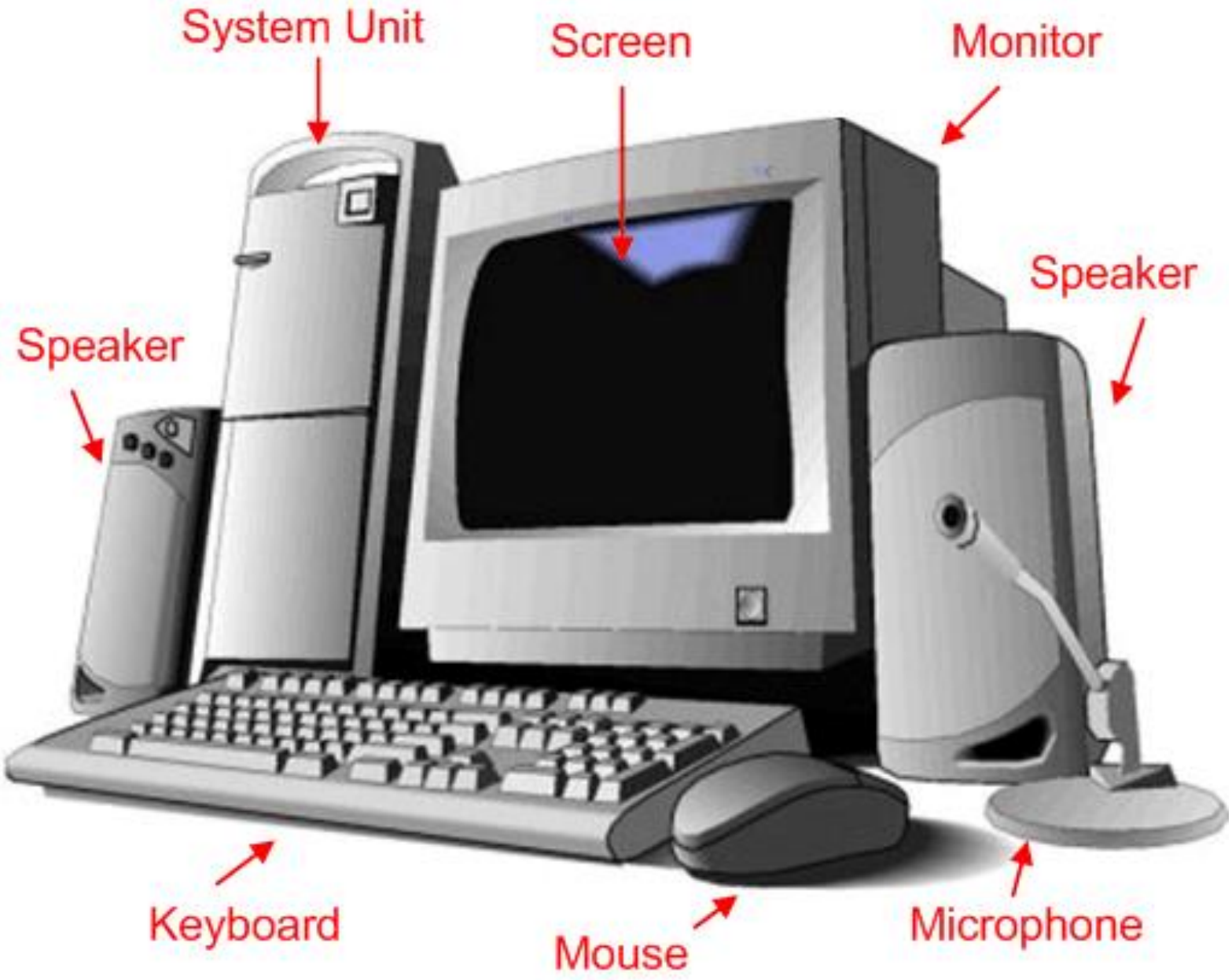
Structured Programming Language

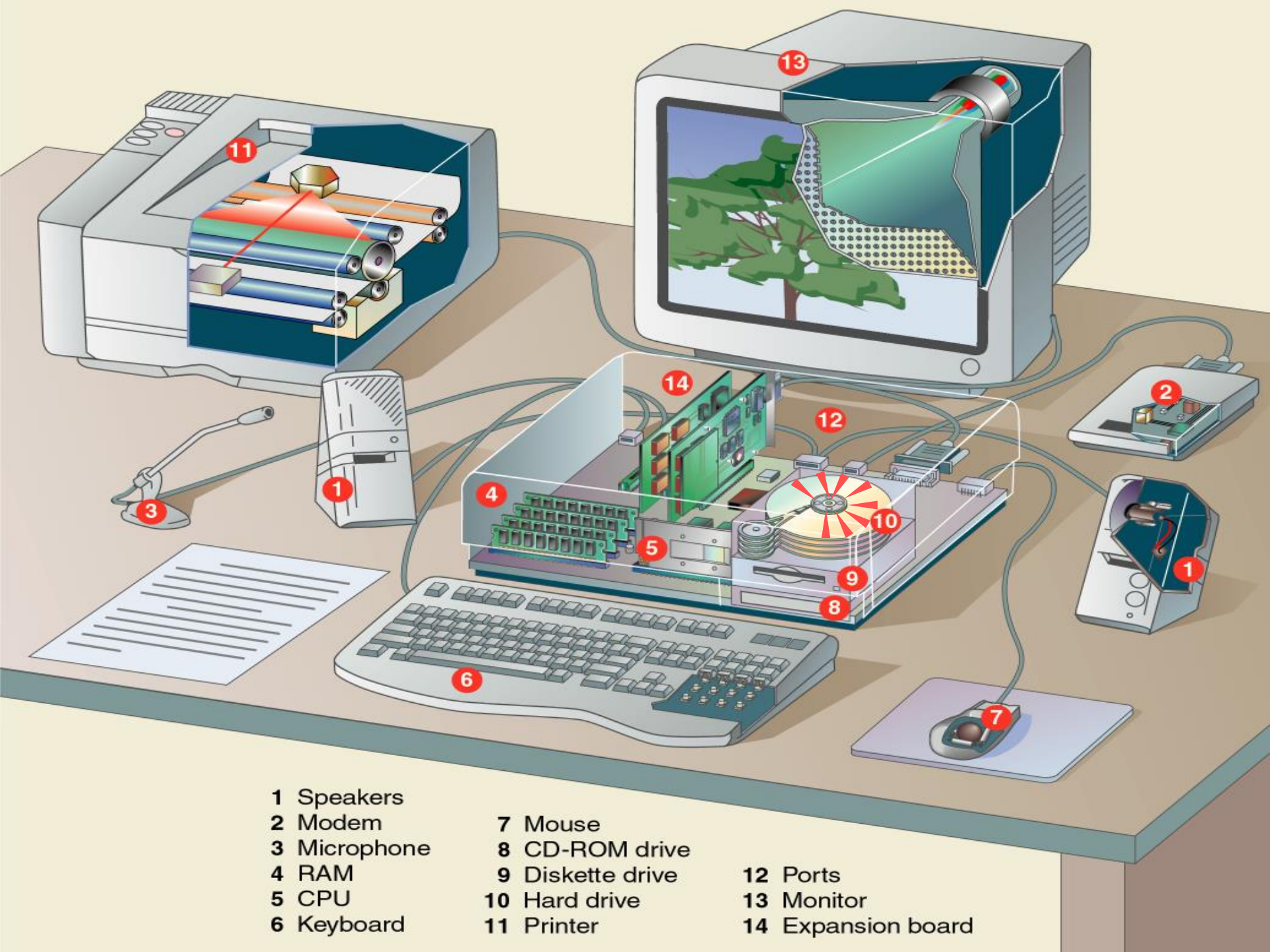
Introduction to Computer

What Is a Computer?

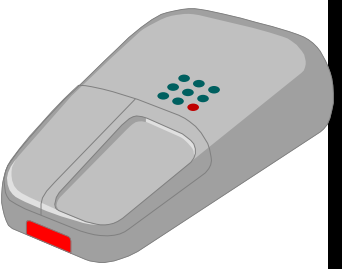
- Computer is a
  - device capable of performing computations and making logical decisions
  - Computer has two parts-
    - Hardware
    - Software

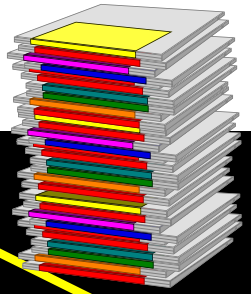



System Unit
Screen
Monitor
Speaker
Speaker
Keyboard
Mouse
Microphone


1 Speakers
2 Modem
3 Microphone
4 RAM
5 CPU
6 Keyboard
7 Mouse
8 CD-ROM drive
9 Diskette drive
10 Hard drive
11 Printer
12 Ports
13 Monitor
14 Expansion board

Hardware



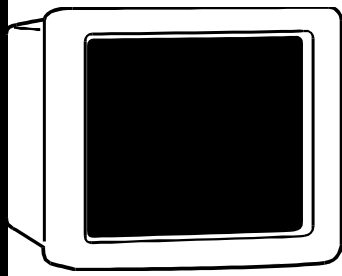


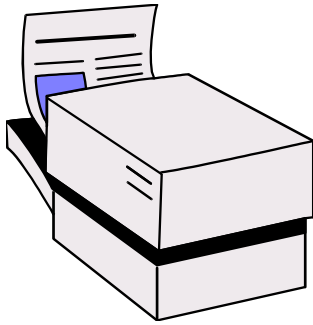
Memory

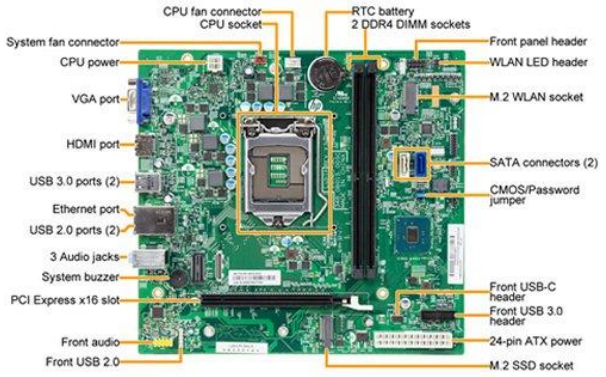
Input Devices

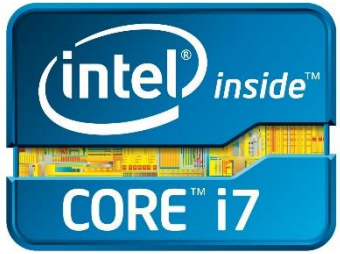
Output Devices

CPU







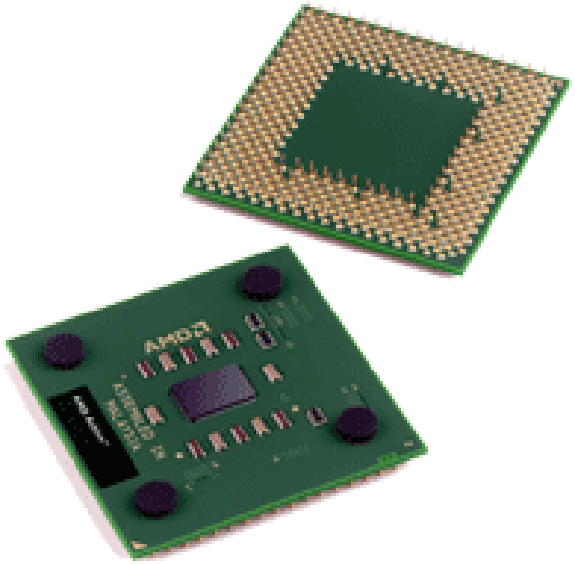


Basic hardware of a PC system

- Central Processing Unit (CPU)
- Memory Unit
- Input Devices
- Output Devices
- Secondary Storage Devices

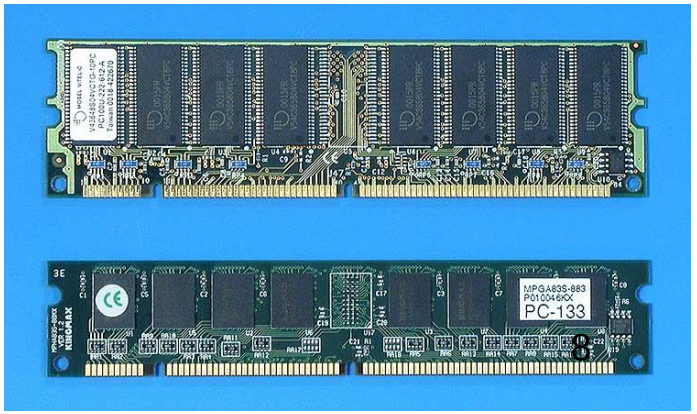
1. Central Processing Unit

- Brain of the computer.
- It directs and controls the entire computer system and performs all arithmetic and logical operations.



2. Memory Unit

- Where the programs and data are stored .
  - READ ONLY MEMORY (ROM) contains the pre-programmed computer instructions such as the Basic Input Output System (BIOS).
  - RANDOM ACCESS MEMORY (RAM) is used to store the programs and data that you will run. Exists only when there is power.



3. Input Devices

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

Keyboard

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

Keyboard Cont…

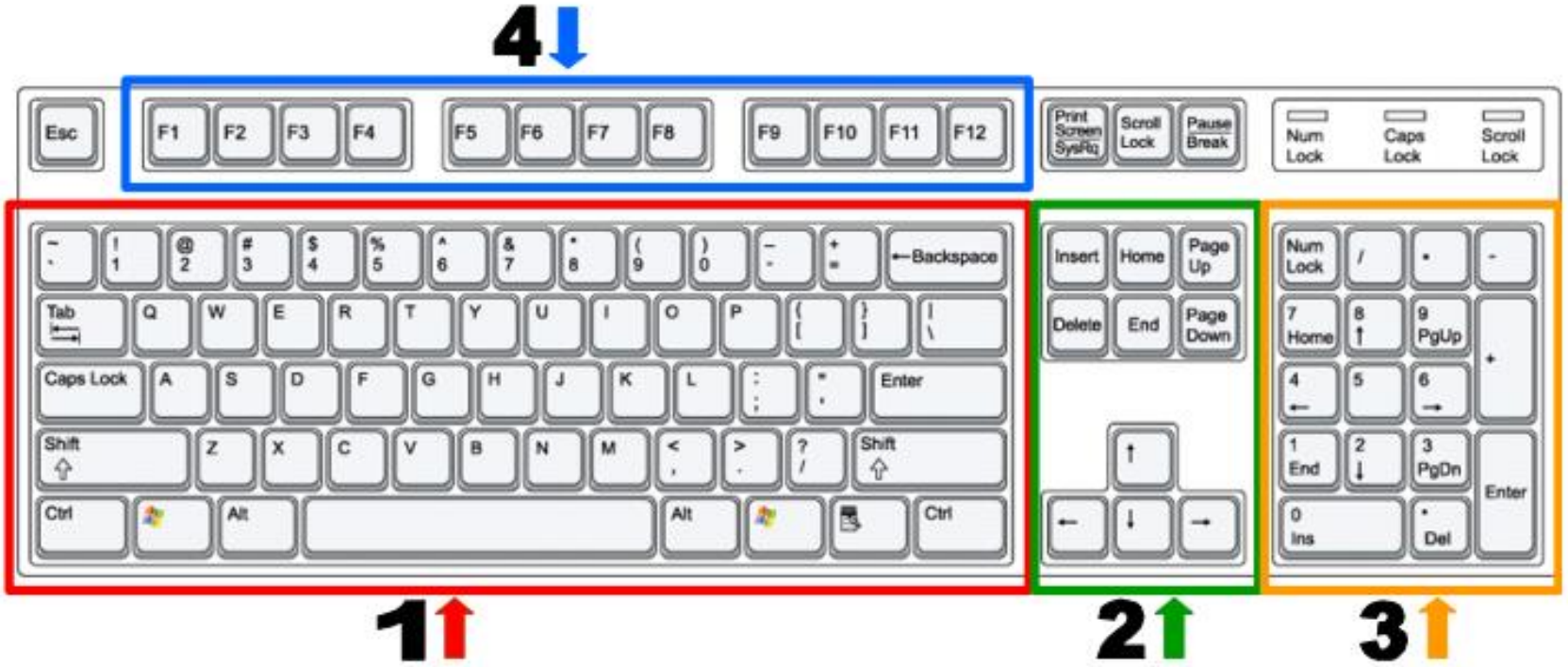
- Keyboard is the most common and very popular input device which helps to input data to the computer.
- The layout of the keyboard is like that of traditional typewriter, although there are some additional keys provided for performing additional functions.
- Keyboards are of two sizes
  - 84 keys or
  - 101/102 keys,

  but now keyboards with 104 keys or 108 keys are also available for Windows and Internet.

Keyboard Cont…

The Standard 104-key Windows Keyboard has four distinct sections:

1. The **Alphanumeric** keys
2. The **Cursor Movement** keys
3. The **Numeric Keypad**
4. The **Function** keys



Keyboard Cont…

S.No	Keys & Description
1	**Typing Keys** These keys include the letter keys (A-Z) and digit keys (09) which generally give the same layout as that of typewriters.
2	**Numeric Keypad** It is used to enter the 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 machines and calculators.
3	**Function Keys** The twelve function keys are present on the keyboard which are arranged in a row at the top of the keyboard. Each function key has a unique meaning and is used for some specific purpose.
4	**Control keys** These keys provide cursor and screen control. It includes four directional arrow keys. 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.

Mouse

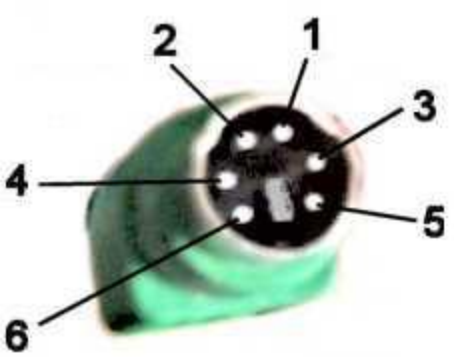
- Mouse is a device that controls the movement of the cursor (pointer) on a computers display screen. Old mouse have got two buttons, the right and left button while modern ones will have a third scroll button in between the two.
- To use the mouse, one points and clicks to issue instructions to the computer.
- It was invented by **Douglas Engelbart** of Stanford Research Center in 1963 and then pioneered by **Xerox** in the 1970s. This invention came as a major breakthrough in computer ergonomics.

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.

How a Mouse Hooks Up to a PC

- PS/2 Mouse



- Serial Mouse

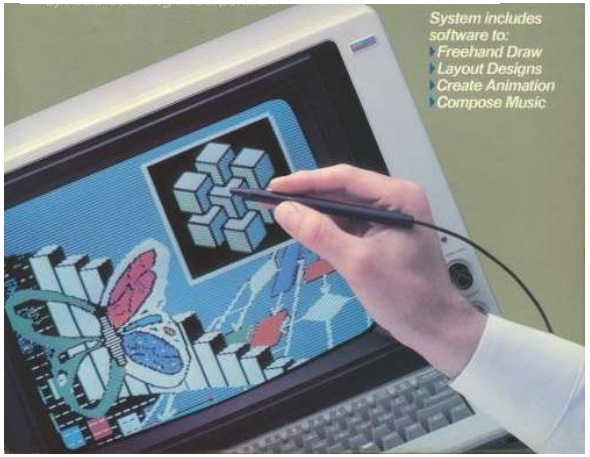
- USB/Cordless Mouse

Other Pointing Devices

- Trackball
- Track point
- Touch pad
- Touch Screen

- Joystick – input device for computer games

- Light Pens – light-sensitive penlike device



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

Scanning Devices

- Optical scanners
- Card readers
- Bar code readers
- Character and mark recognition devices

Image Capturing Devices

- Digital Cameras

- Digital Video Cameras

4. Output Devices

- Media used by the computer in displaying its responses to our requests and instructions.
  - Monitor
  - Audio Speakers
  - Printer

Types of Monitor

- Cathode Ray Tube (CRT)
- Liquid Crystal Display (LCD)

- LED (Light emitting diode)

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.

Dot matrix printer

Inkjet printer

Laser printer

5. Secondary Storage Devices

- Attached to the computer system to allow you to store programs and data permanently for the purpose of retrieving them for future use.
- Floppy disk, Hard disk, CD Rom

Floppy Disk

- The most common secondary storage device
- 3.5” disk – 1.44MB

High-Capacity Floppy Disks

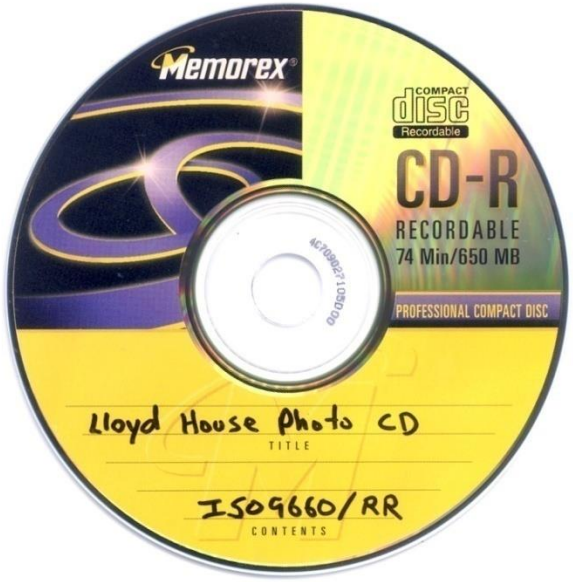
- Floppy disk cartridges
- 3 ½ inches in diameter
- Stores more information
- Zip disks

Hard Disk Drive or Hard Disk

- Made of rigid materials unlike floppy disks
- Holds a greater amount of data

Optical Discs

- A standard part of modern desktop machines, especially used for multimedia purposes and preferred in loading applications.



Kinds

- Blue Ray Disk – 40G
- Digital Versatile Disk
  - DVD-R – write once, 3.95G
  - DVD RW – rewritable, 3G
  - Single Layer and Double Layer
- Compact Disk
  - CD-R – write once, 650MB
  - CD-RW – rewritable, 700MB

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

Other Secondary Storage

- Solid-State Storage
  - No moving parts
  - Flash memory cards

  - USB flash drives

Parts that Build Up A System Unit

- Casing or cover
- Power Supply
- Motherboard
- Microprocessor
- Memory
- Video Card
- Sound card
- Floppy disk drive
- Hard disk drive
- CD-ROM drive
- MODEM

Casing or cover

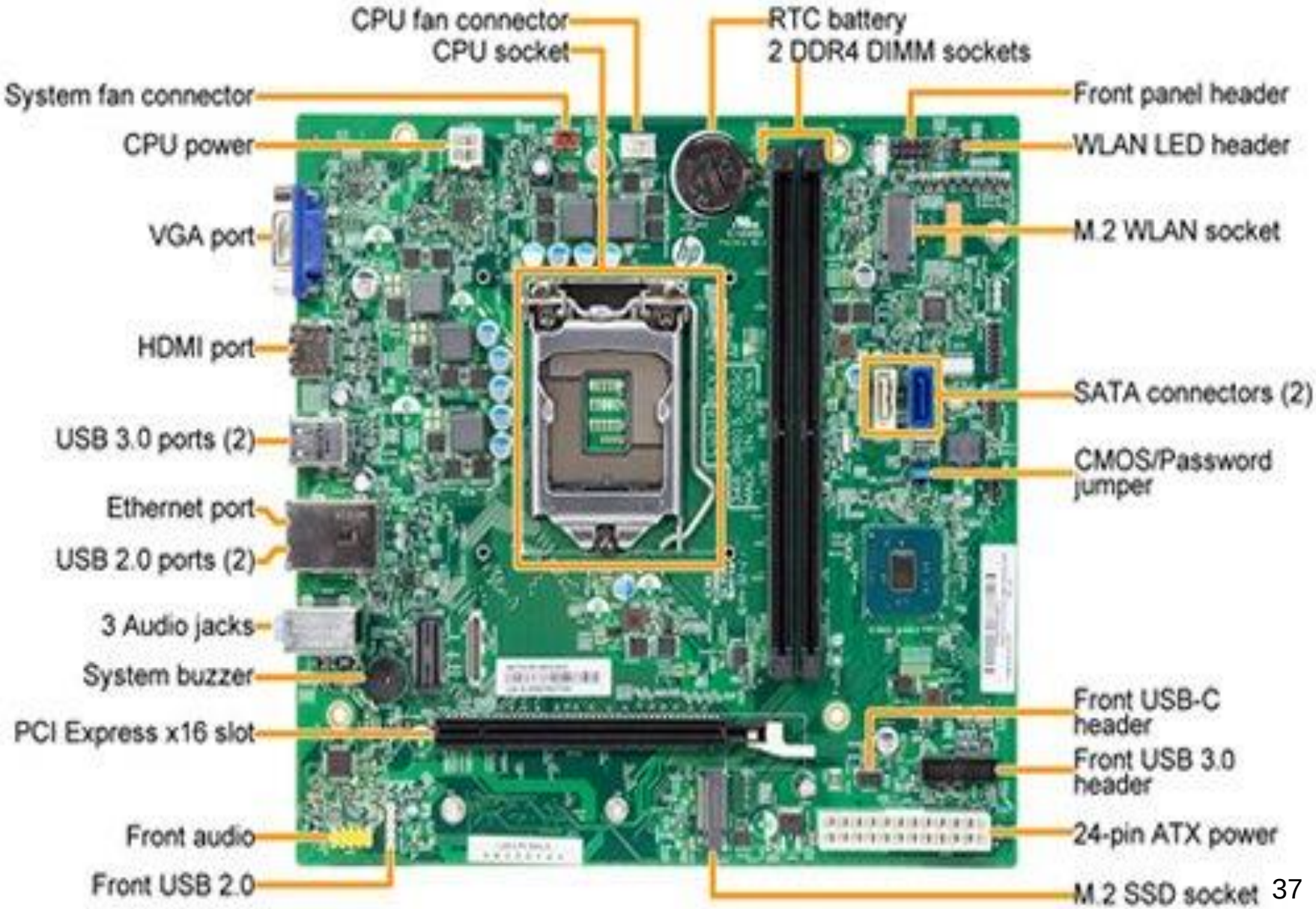
- The box or outer shell that houses most of the computer, it is usually one of the most overlooked parts of the PC.
- Protects the computer circuits, cooling and system organization.

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

Motherboard

- The physical arrangement in a computer that contains the computer's basic circuitry and components.
- Components are:
  - Microprocessor
  - (Optional) Coprocessors
  - Memory
  - Basic Input/Output System (BIOS)
  - Expansion Slot
  - Interconnecting circuitry

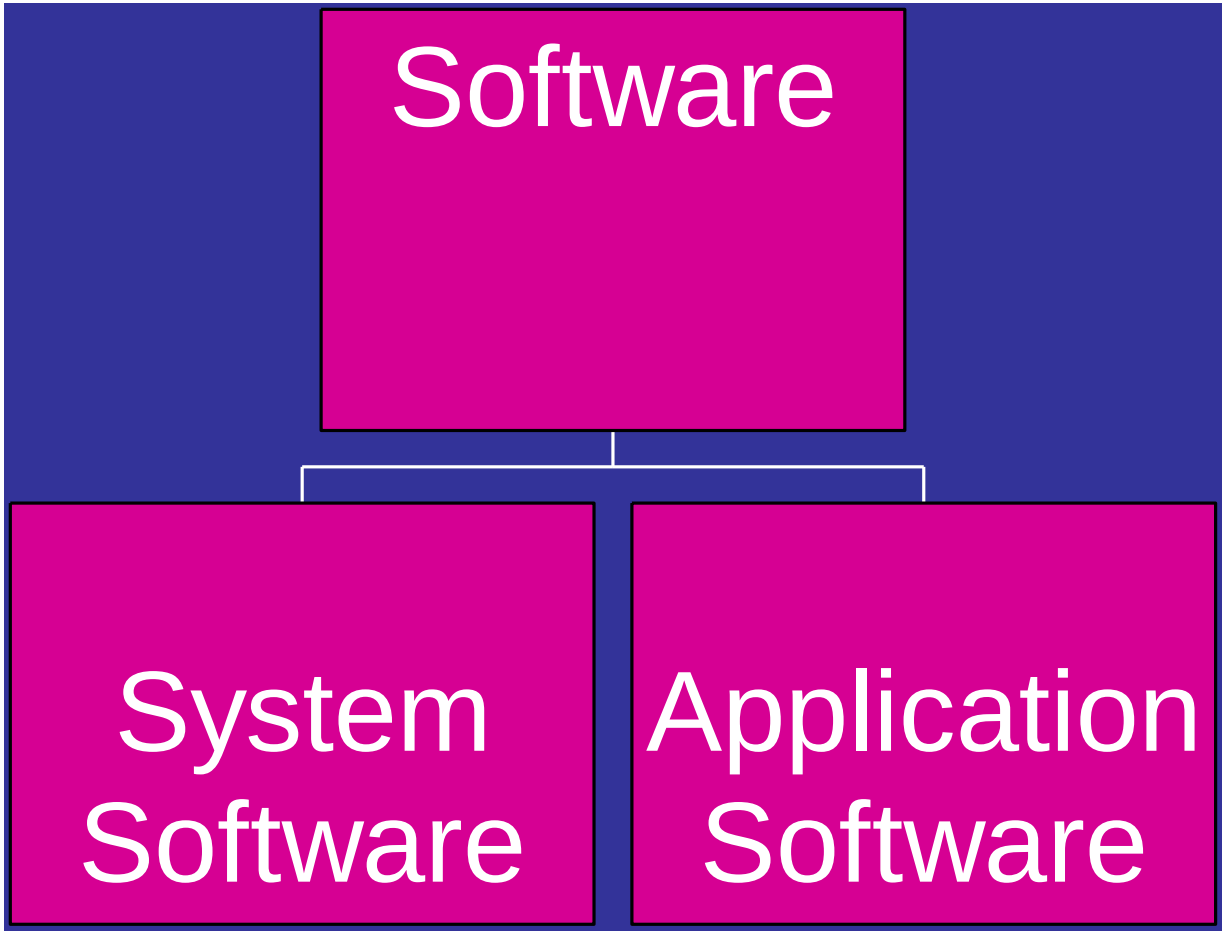

CPU fan connector
CPU socket
RTC battery
2 DDR4 DIMM sockets
System fan connector
Front panel header
CPU power
WLAN LED header
VGA port
M.2 WLAN socket
HDMI port
SATA connectors (2)
USB 3.0 ports (2)
CMOS/Password jumper
Ethernet port
USB 2.0 ports (2)
3 Audio jacks
System buzzer
Front USB-C header
PCI Express x16 slot
Front USB 3.0 header
24-pin ATX power
Front audio
Front USB 2.0
M.2 SSD socket

Expansion Slots

- Graphic cards
- Sound cards
- Modem cards
- Network interface cards/network adapter

Software

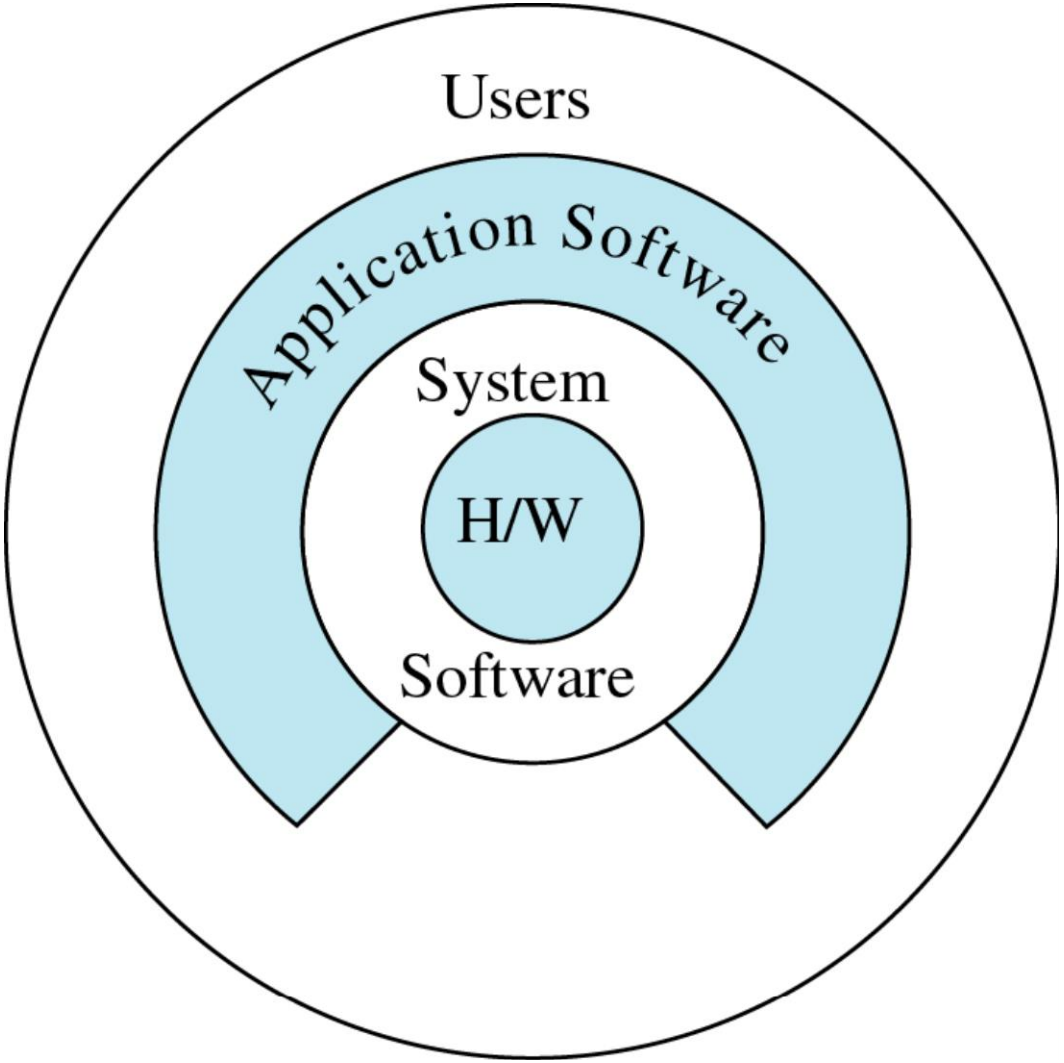
- **Computer software**, or simply **software**, is a generic term that refers to a collection of computer instructions that tell the computer how to work.
- Software is a program executed by computer.
- Computers process data under the control of sets of instructions called computer programs


Software
System Software
Application Software

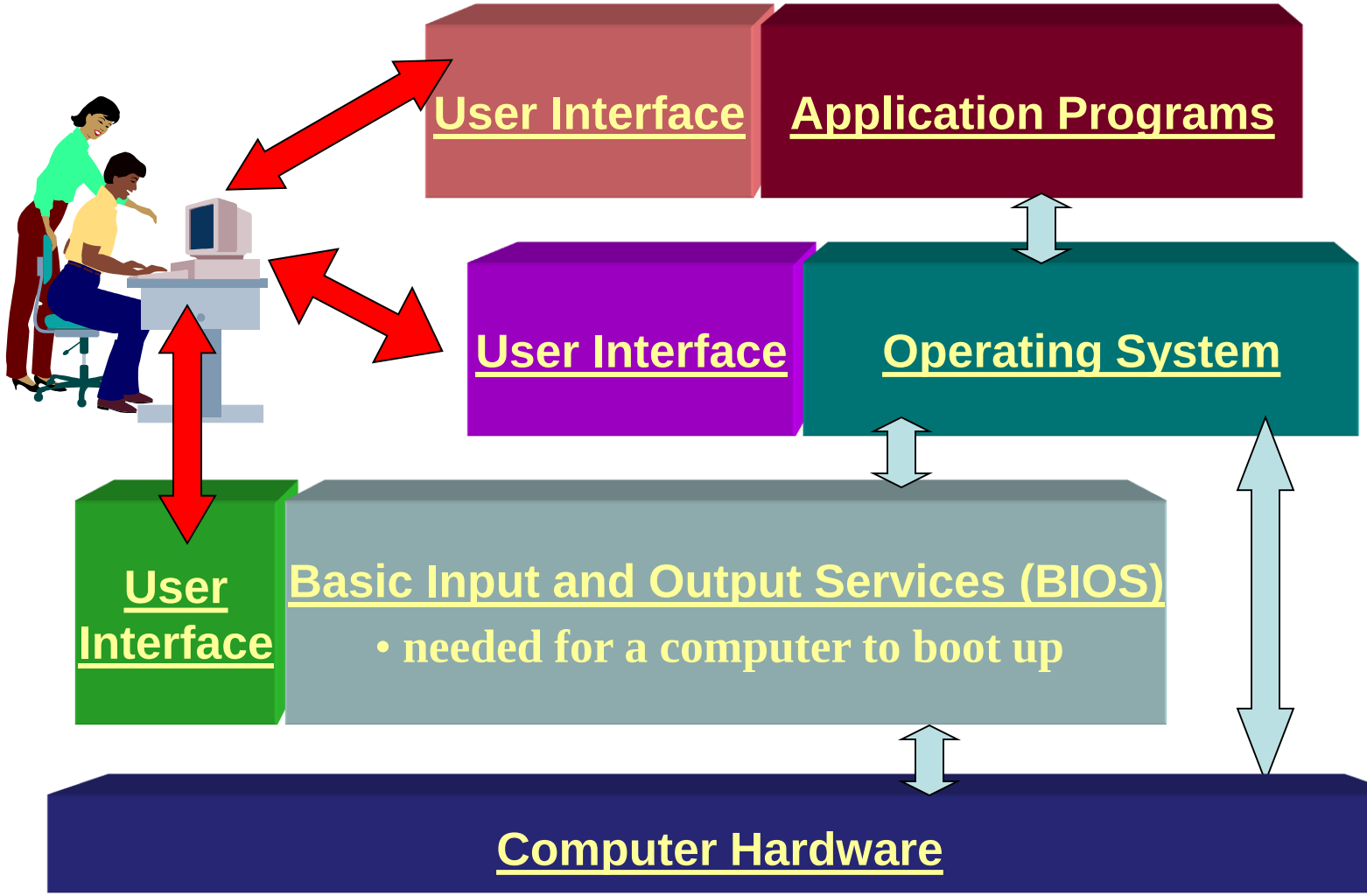
Software

- Application software
  - Easy-to-use programs designed to perform specific tasks
- System software
  - Programs that support the execution and development of other programs
  - Two major types
    - Operating systems
    - Translation systems (compilers & linkers)

Computer Architecture

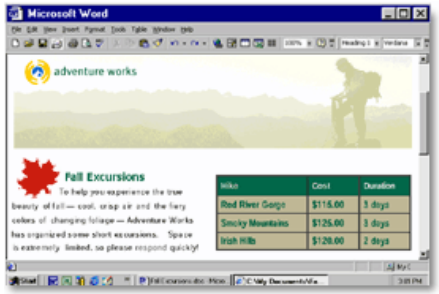


Computer Software Relationships



Application Software

- Application software makes computer popular and easy to use
- Common application software:
  - Microsoft Word, WordPerfect
  - PowerPoint
  - Netscape, Internet Explorer, Chrome
  - PhotoShop, Photo-Paint
  - Quick Time
  - Dreamweaver



Computer Viruses

Computer Viruses

- A computer virus is an application program designed and written to destroy other programs.

- It has the ability to:
  - Link itself to other programs
  - Copy itself (it looks as if it repeats itself)

Examples of Viruses

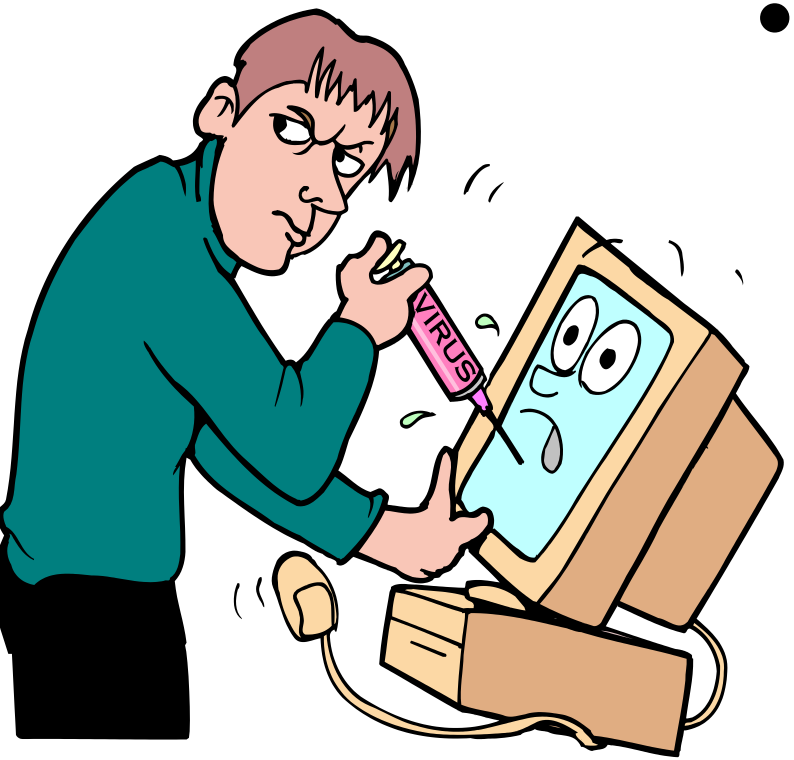
- ABC
- Crabs
- CIH
- Ransomware
- Spyware
- Adware,
- Trojan Horses
- Keyloggers,
- Rootkits,
- Bootkits

Viruses and Virus Protection

- A virus program
  - Infects programs, documents, databases and more …
  - It is man-made
  - It can hide and reproduce
  - It can lay dormant (inactive) and then activate

Anti-virus programs can help

Sources of Computer Viruses



- Three primary sources
  - The Internet
    - Via downloads and exchanges
  - Diskettes
    - Exchanging disks
  - Computer networks
    - Can spread from one network to another

How do you know if you have a virus?

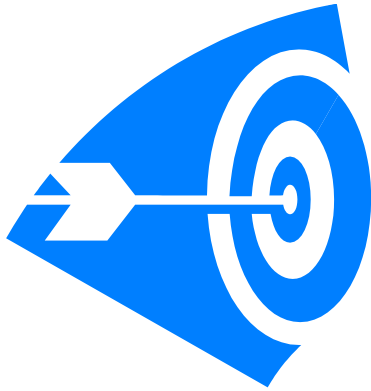
- Lack of storage capability
- Decrease in the speed of executing programs
- Unexpected error messages
- Halting the system

Virus Protection

- The software package distributed with new PCs always includes an **antiviral program.**

- The best way to cope with viruses is to recognize their existence and use an antiviral, or antivirus program.

Characteristics of Computers



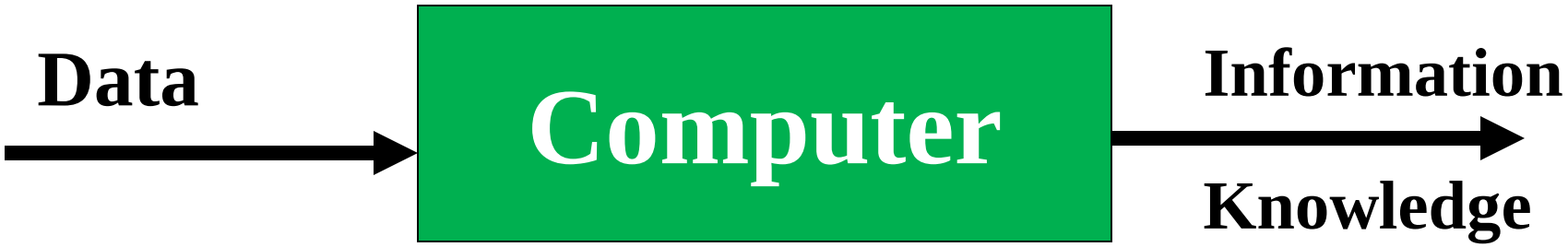
1- Store a large amount of data and information for a long period of time.

2- process data and information in high accuracy level .

3- Speed in processing data/information.

4- Sharing of information over network.

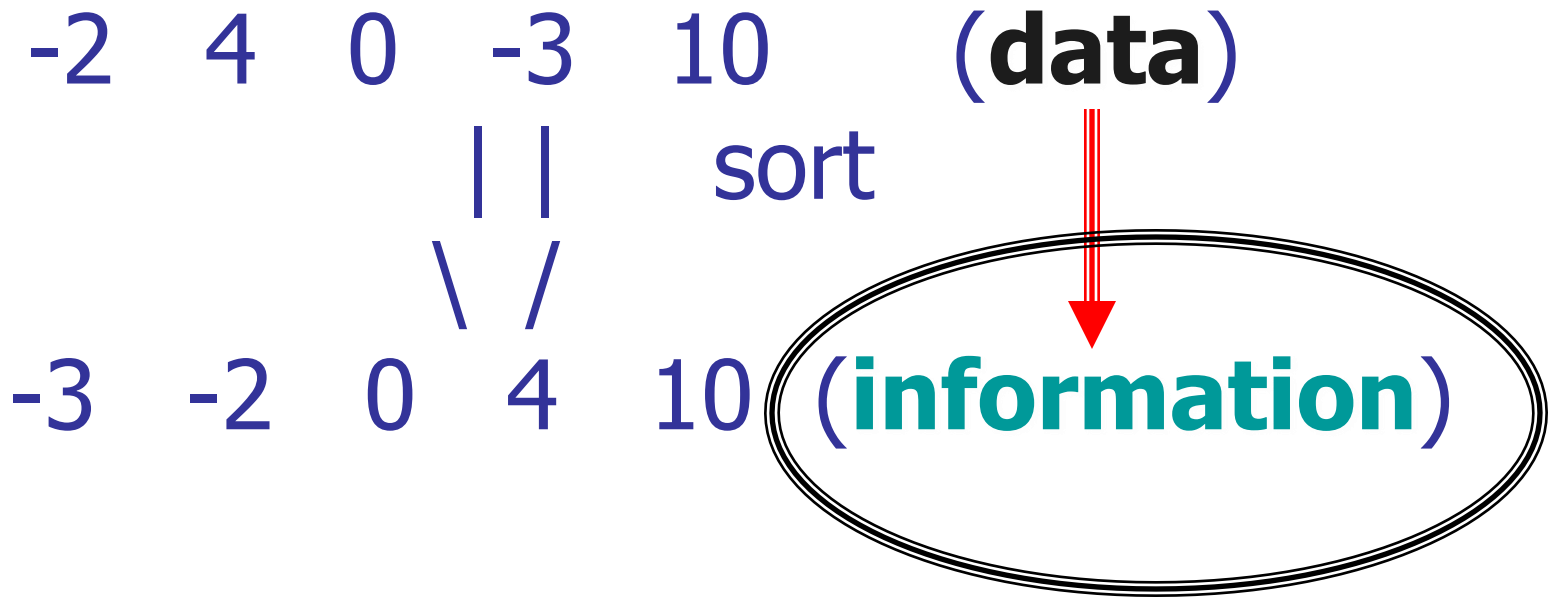
Characteristics of Computers



Information Processing System

- Data is a collection of independent and unorganized or raw facts.
- Information is the processed and organized data presented in a meaningful form.
- Data Processing is the course of doing things in a sequence of steps.
- Knowledge is arrangement of information and classifying information of the same type or the same topic.

- e. g.



Processing **data** produces **information**, and processing information produces **knowledge**.