Concepts of Computers

Agenda

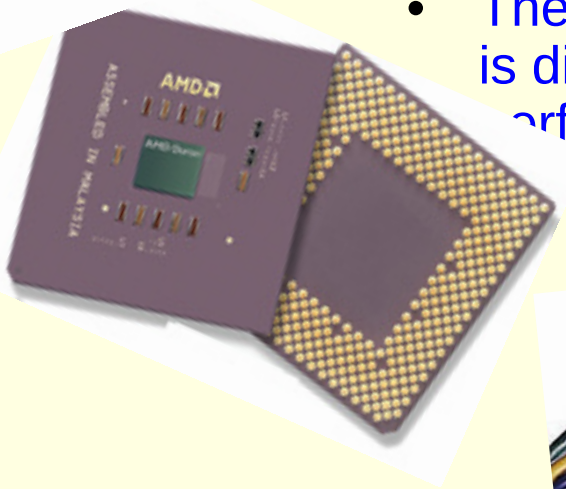
- Computer Hardware
  - Input Devices
  - Output Devices
  - Secondary Storage
- Computer Software
  - System Software
  - Application Software
  - Working with Windows

A Computer is a device which allows you to

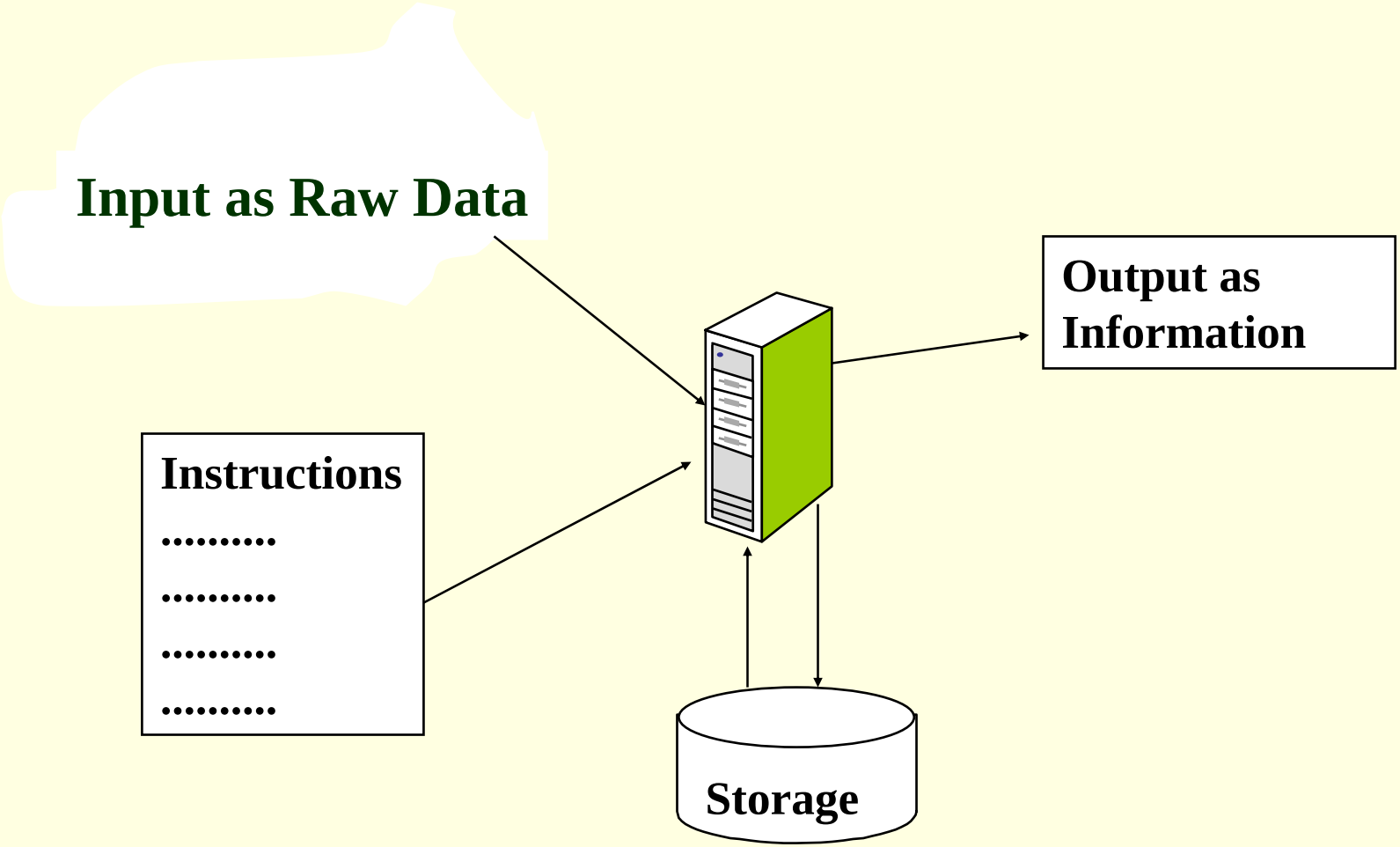
- ➔Input raw data
- ➔Perform Computations/Processing
- ➔Store the data for retrieval
- ➔Obtain desired information

A computer is:

- An electronic machine that can be programmed to accept data (*input*), and process it into useful information (*output*). Data is put in secondary storage for safekeeping or later use.
- The *processing* of input into output is directed by the software, but performed by the hardware.



COMPUTER TECHNOLOGY IS COMPLEX BUT BASED ON SIMPLE PRINCIPLE



Computers process data by means of a binary system.

- Computers are devices powered by electricity, which has two discrete states: **On** or **Off**.

- Two digits represent these states: **0** for the electronic state of Off, and **1** representing On (the presence of an electronic charge).

What are the main components ?

- Hardware
- Software

Basic Computer Hardware

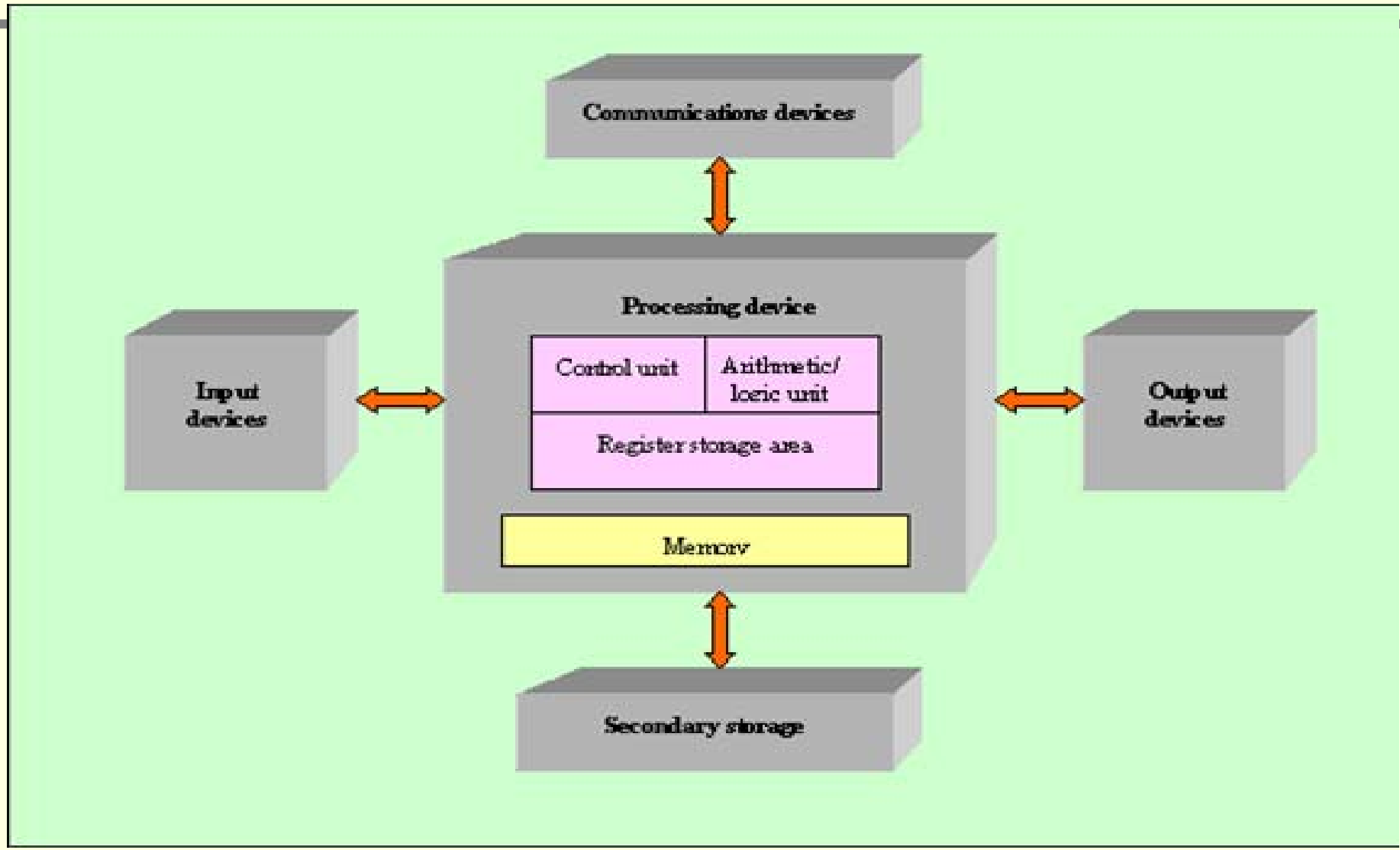
Computer systems consist of the following hardware components:

- **Input devices** accept data or commands in a form useable by computers. Data and commands can also be sent to the processing unit; e.g., keyboards, mice, scanners, microphone, digital camera.
- **Output devices** display the processed information understandably and usefully; e.g. printers, monitors, speakers.
- **Processing devices** are contained in a computer's system unit and are comprised of circuitry. The main circuit board is the motherboard, with its central processing unit (CPU) and memory.

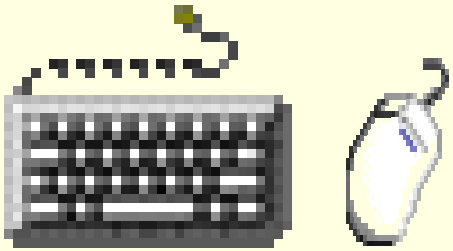
•**Storage devices** include secondary storage for data and programs outside the computer's processing unit; e.g. hard disk drives, floppy disk drives, Zip drives, CD-ROM, CD-RW and DVD-ROM drives. Drives read from and write to storage media (the physical material that can store data and programs).

•**Communication devices** provide connections between computers and communication networks, allowing for exchange of information and data with other computers via transmission media such as cables, telephone lines and satellites.

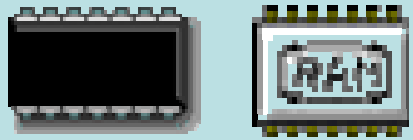
Graphic Representation of Computer Components:



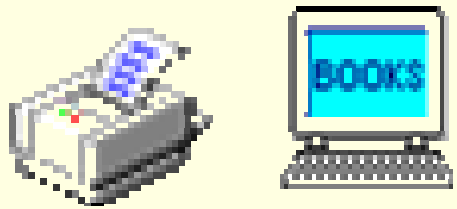
Input Devices



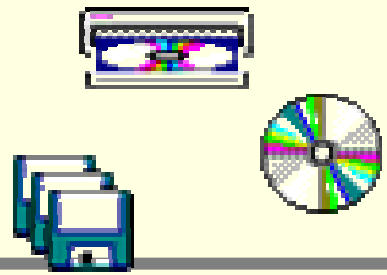
PROCESSOR
CPU, ALU, CU
MEMORY



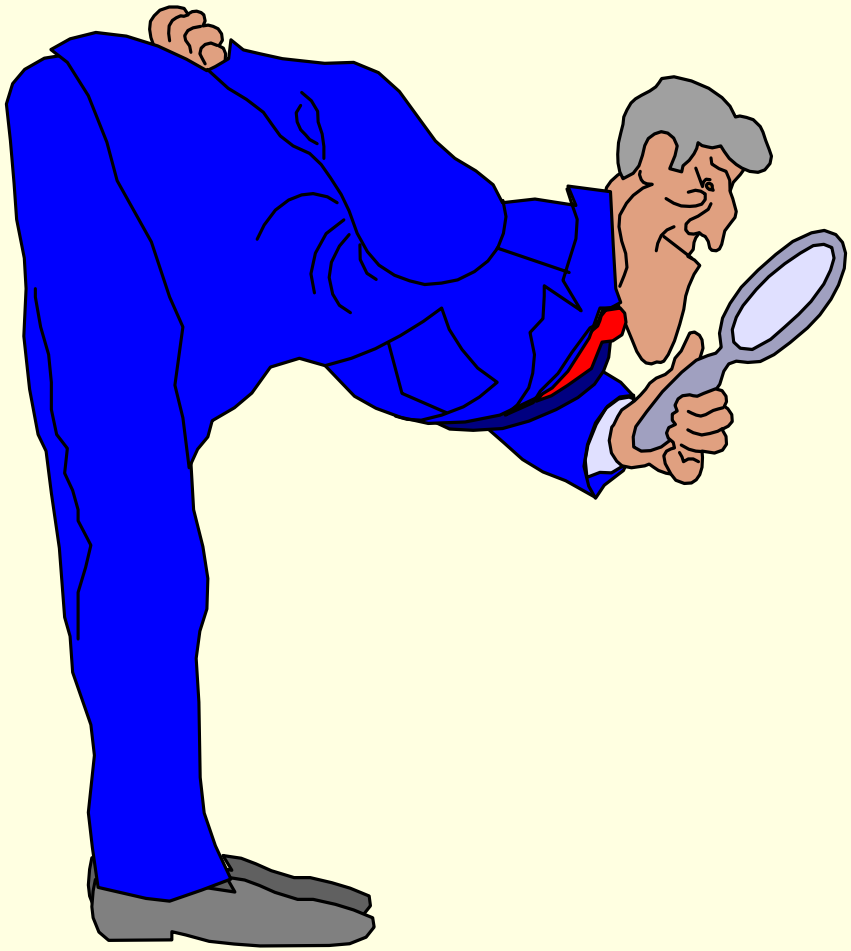
OUTPUT DEVICES

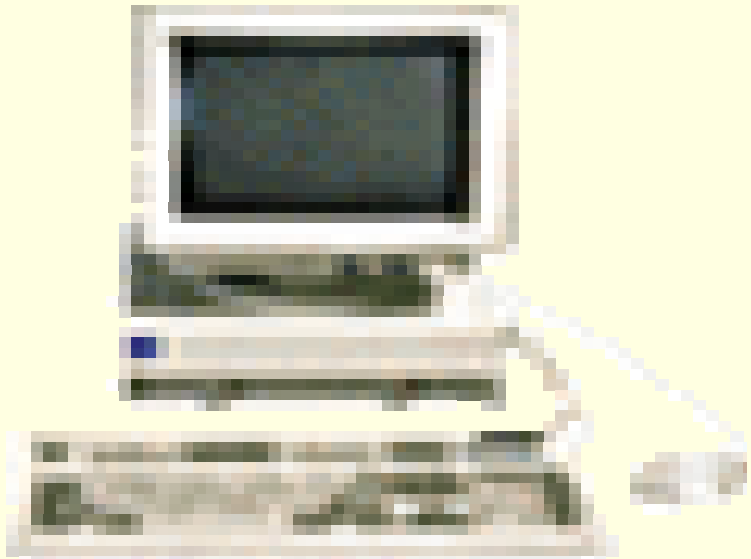


Secondary Storage

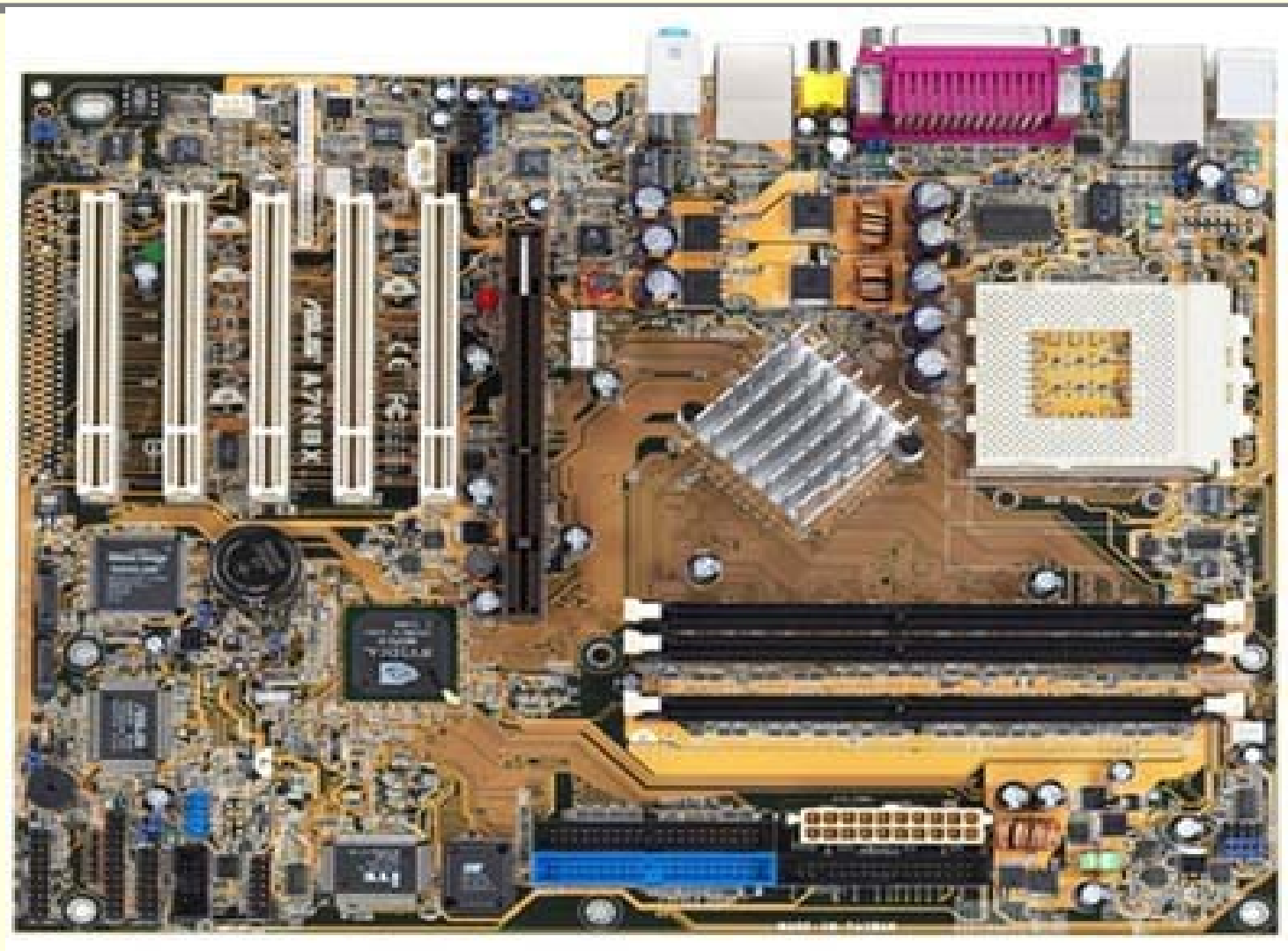


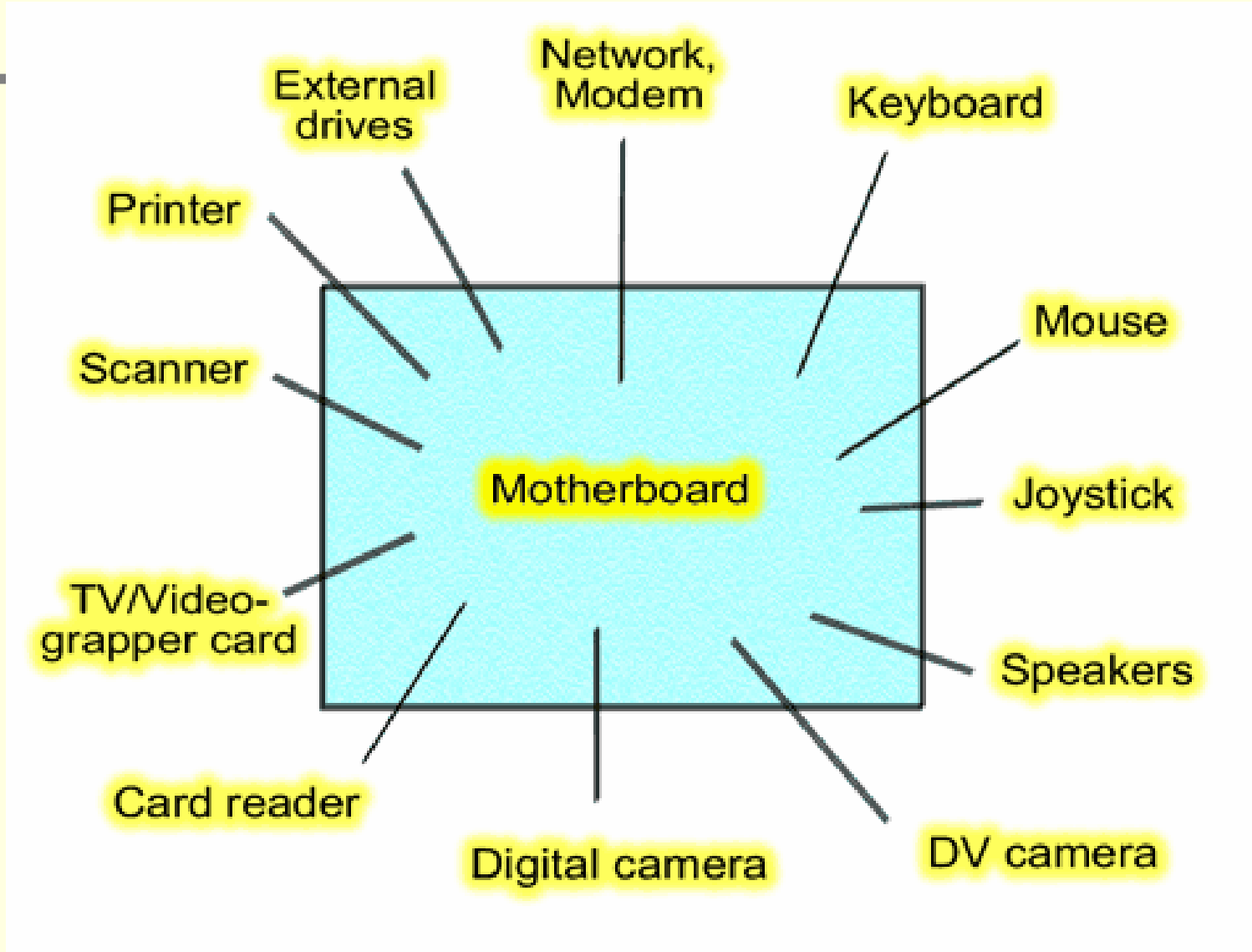
LET US HAVE A LOOK INSIDE





The Motherboard

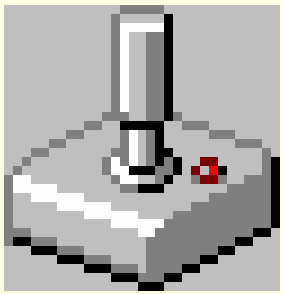



External drives
Network, Modem
Keyboard
Printer
Mouse
Scanner
Motherboard
Joystick
TV/Video-grapper card
Speakers
Card reader
Digital camera
DV camera

INPUT DEVICES

Keyboard

Scanner



Joystick

Mouse

Mouse Pointer Forms

Standard Pointer form.

Form when changing a window's height

Form when changing a window's width

Form when changing a window's height and width simultaneously

Form when changing a width of a field in a table

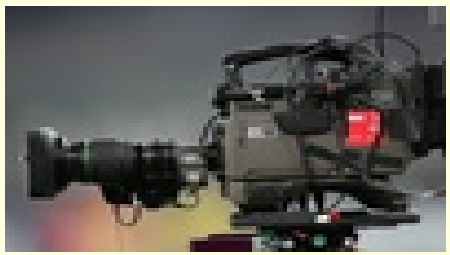
Form when inserting the text

 Form when moving a field to a new position in the table

Form when application being executed or a wait state

INPUT DEVICES Contd…

Digital Camera



Digital Video camera

Bar code Scanner

OUTPUT DEVICES

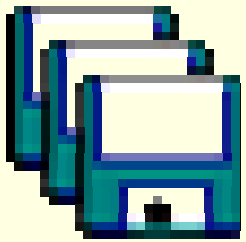
Printer

Monitor

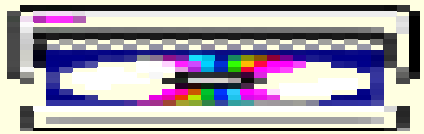
Speakers

Fax

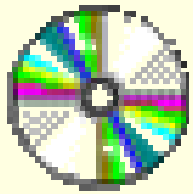
SECONDARY STORAGE DEVICES



Floppy



Magnetic Tape



CDROM

Hard Disk

Secondary Storage Devices Contd…

- Disk drives
  - Internal & External
  - Hard drives
  - Removable disk drives
    - Floppy disks (1.4 MB)
    - CD-ROM (700MB), DVD-ROM (~5GB/side)
      - read only (-ROM), write once (-R), re-writeable (-RW)
    - Combination drive
      - CD-RW/DVD-ROM, CD-RW/DVD-R

External Hard Drives

60 GB External Hard Drive
(Fire Wire)

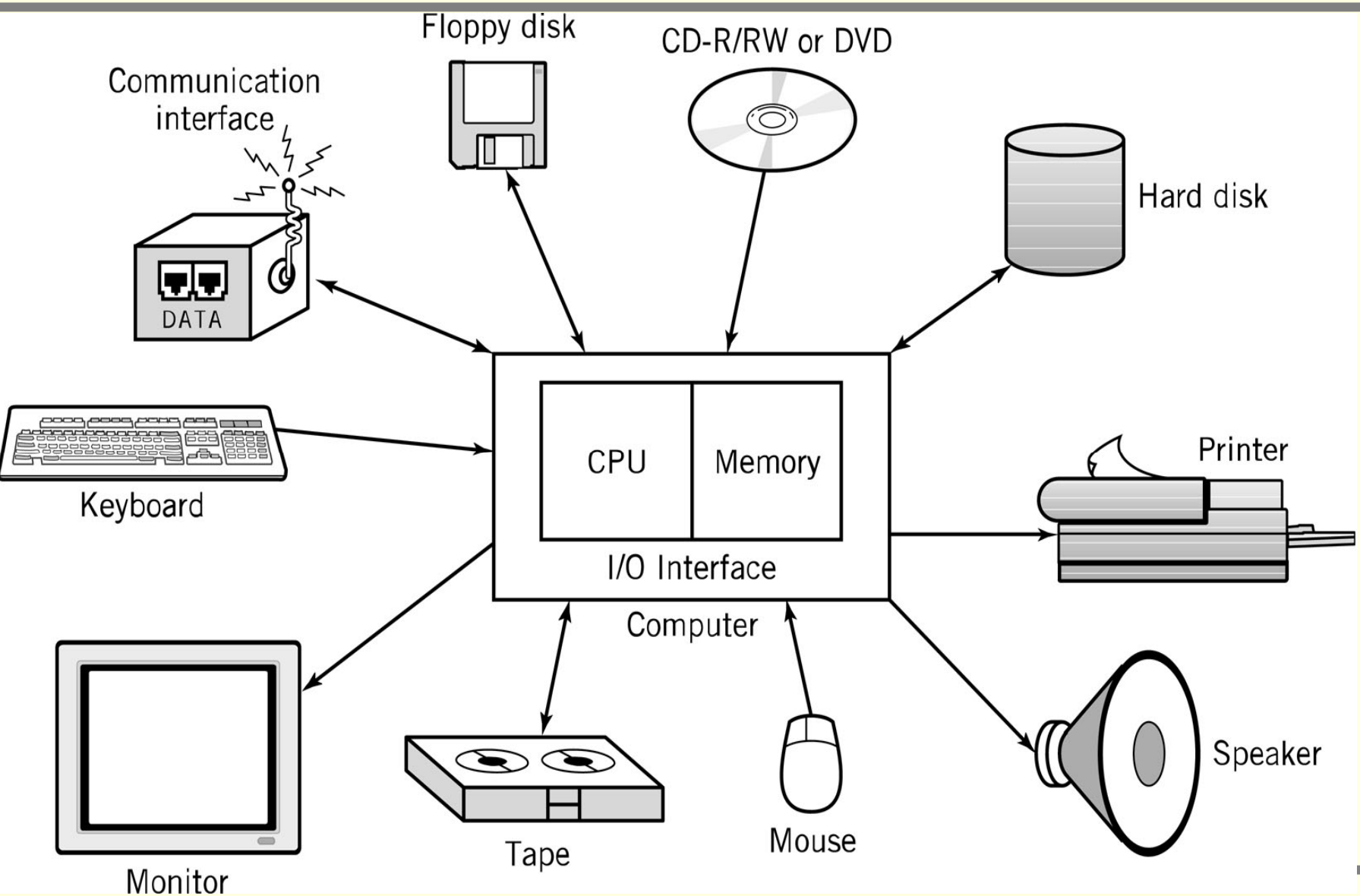
Universal Buslink Corp.

Iomega 60GB Portable
USB Hard Drive

Computer Configuration

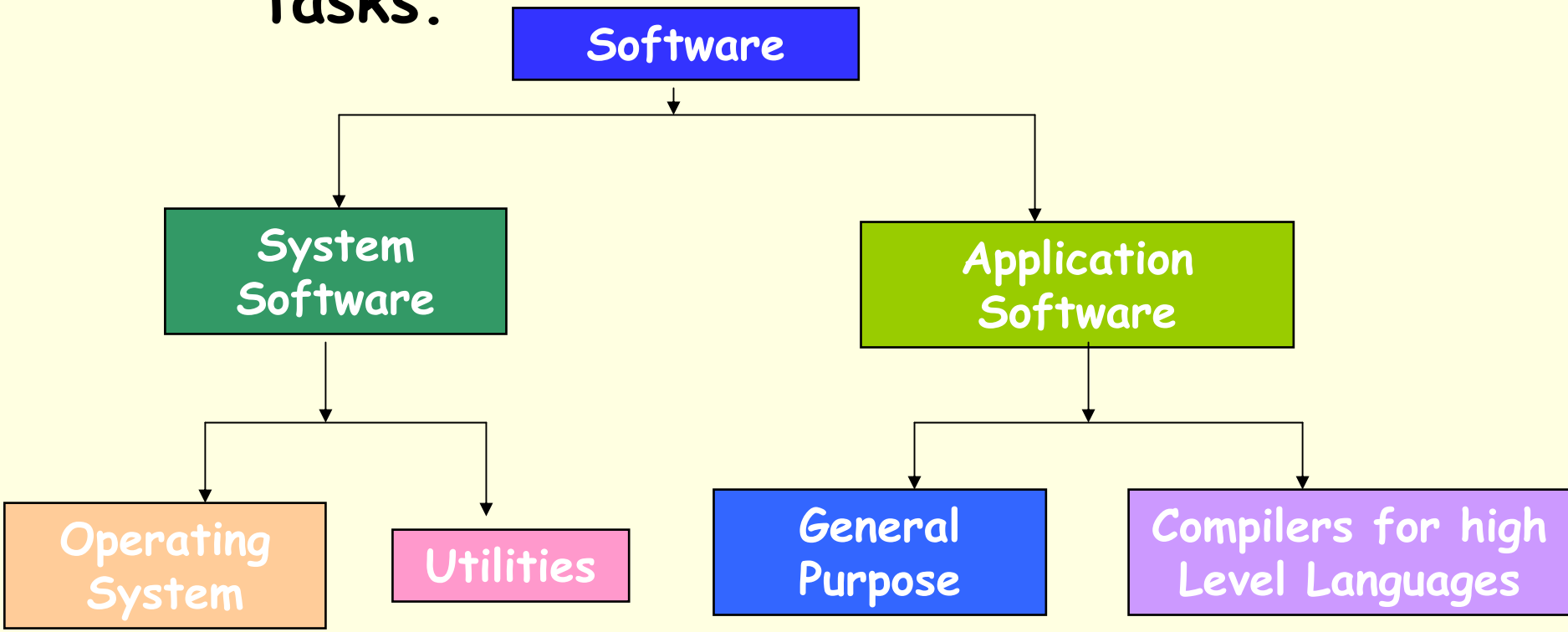
Characteristic	*Example*
✓ Present day PC Family	Pentium IV / Dual Core
✓ Memory	512MB/1GB
✓ Microprocessor chip	Intel P IV / AMD
✓ Clock Speed	3.0 GHz
✓ Cache Memory	512KB
✓ Hard Disk Drive	80GB
✓ Floppy Disk Drives	1.44 MB
✓ CD Drive	52 X
✓ Monitor	TFT Digital Monitor 2MB RAM (1024 X 768)

Hardware recap



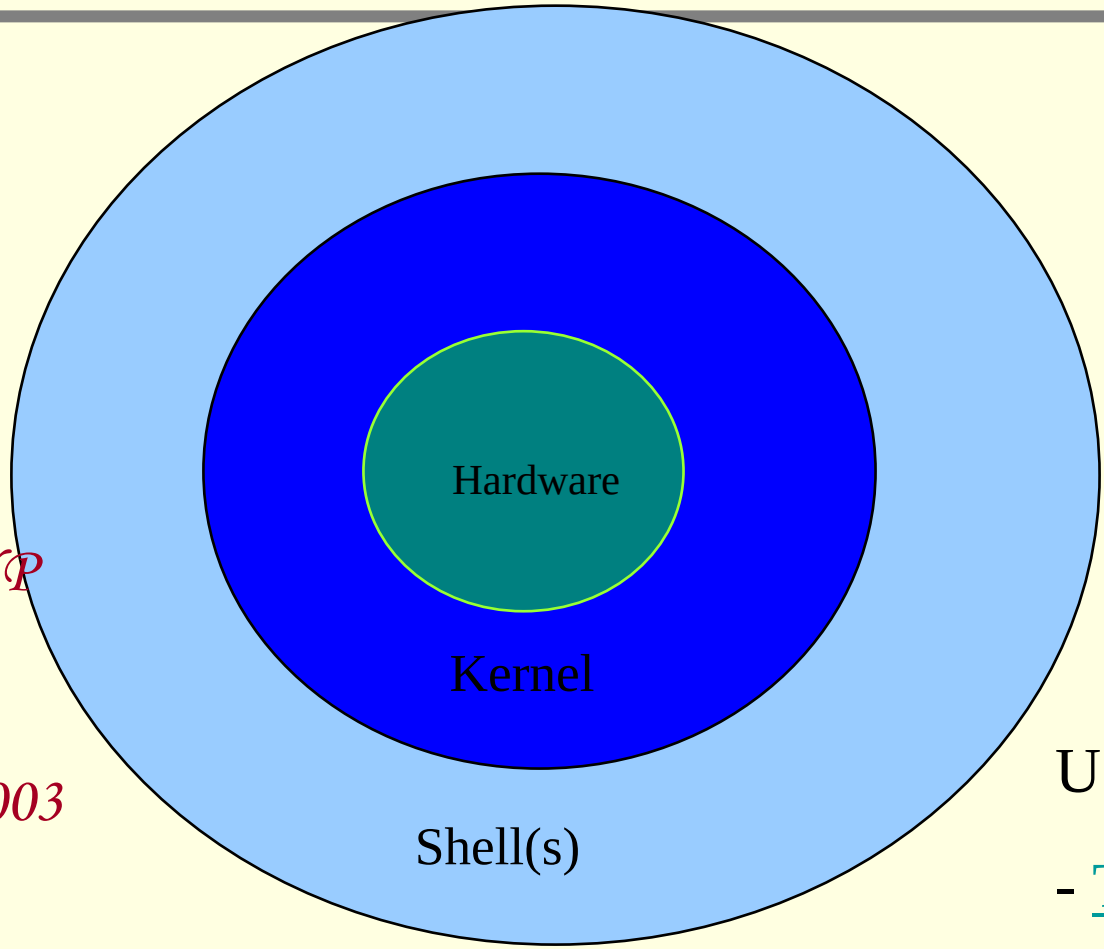
Basic Computer Software

Software: A set of instruction (programs) that makes the hardware perform a particular set of tasks.



Kernel

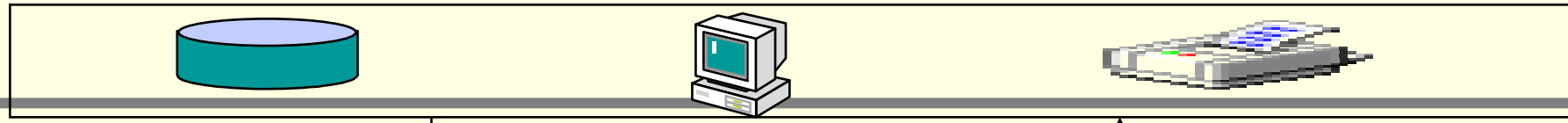
- *DOS*
- *Windows XP*
- *Unix*
- *Windows 2003*
- *Linux*



USER INTERFACE

- Text based
- Windows based

Software Layers in a Computer System



DOS, UNIX, WINDOWS XP, WINDOWS 2000, Linux,OS2, etc.

Memory Management, File Management, Anti Virus etc.

Operating System | Utilities

System Software

Ms-Office, Lotus Page maker, etc.

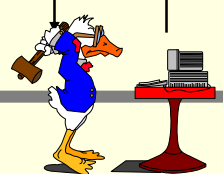
C, C++, .NET Framework, JAVA,

Application Software | Higher Level Languages

General Purpose Software

Scientific | Business | Design | Marketing | Entertainment | …….

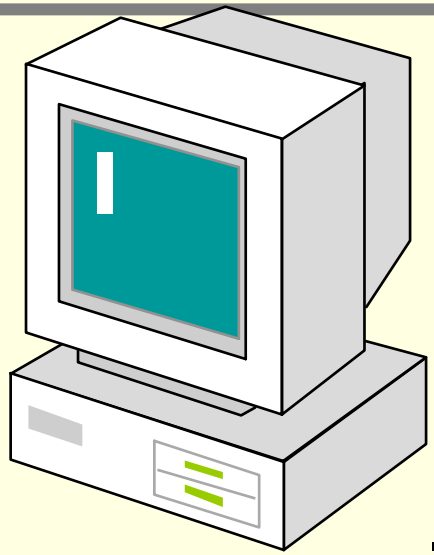
User Designed Application Software



Computing Environments

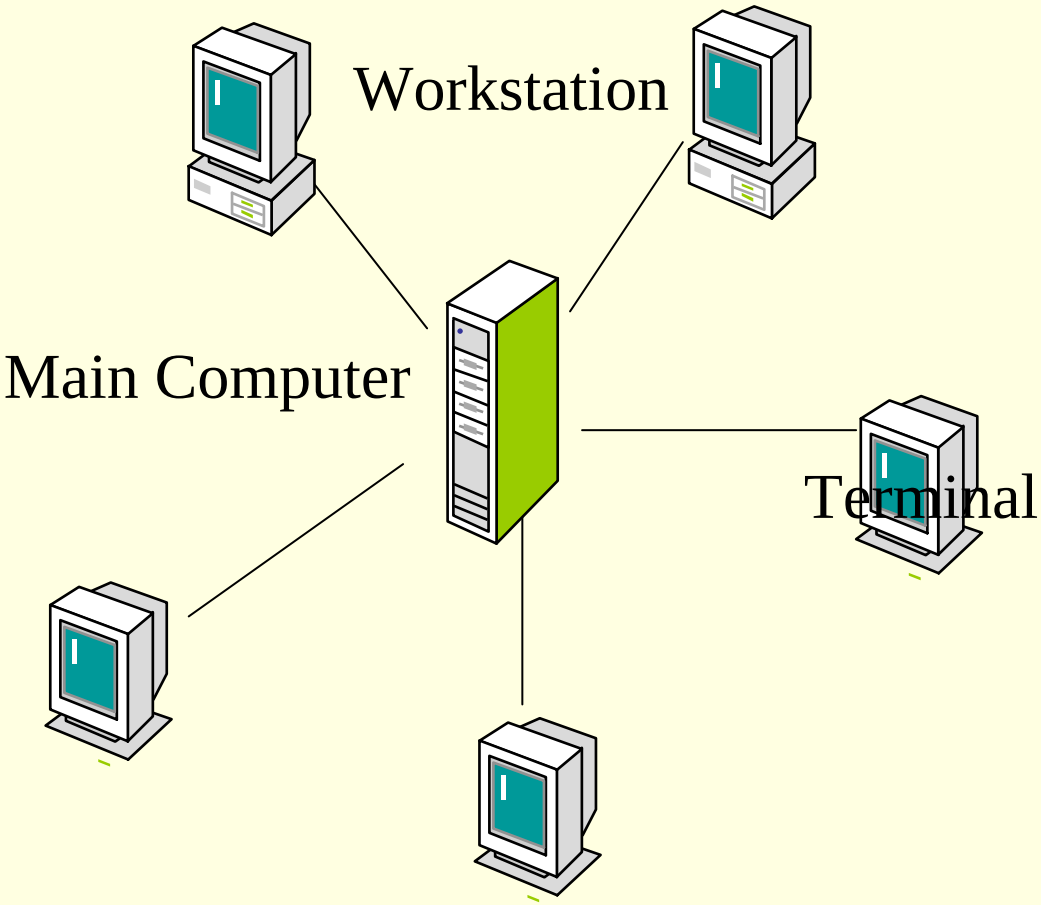
- Single user
- Multi user
- Networked

Personal Computer



Single User System

- **One user can work on it**
- **No efficient use of System**
- **Operating System like MSDOS**



Multi User System

- More than one user can work on the system
- Operating System like Unix, Linux etc
- Resource sharing can be done

Network Basics

- What is networking?
- Goals of a Networking
- Classification of Network

Networking

What is a Network?

- A network is a group of interconnected systems which share services and interact with each other by means of a shared communication link
- These systems can be located anywhere
- Network is often classified according to its geographical size.

Goals of networking

Goal of having networking environment is to provide services and to reduce the equipment costs. The primary reasons for networking Pc's are as follows:

- Sharing files
- Sharing printers and other devices
- Provide Distributed Computing
- Centralized administration of Resources
- Security of Resources

Classification of Network

The most common classification of networks are:

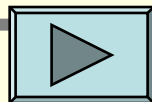
- Local Area Network (LAN)
- Wide Area Network (WAN)
- Metropolitan Area Network (MAN)

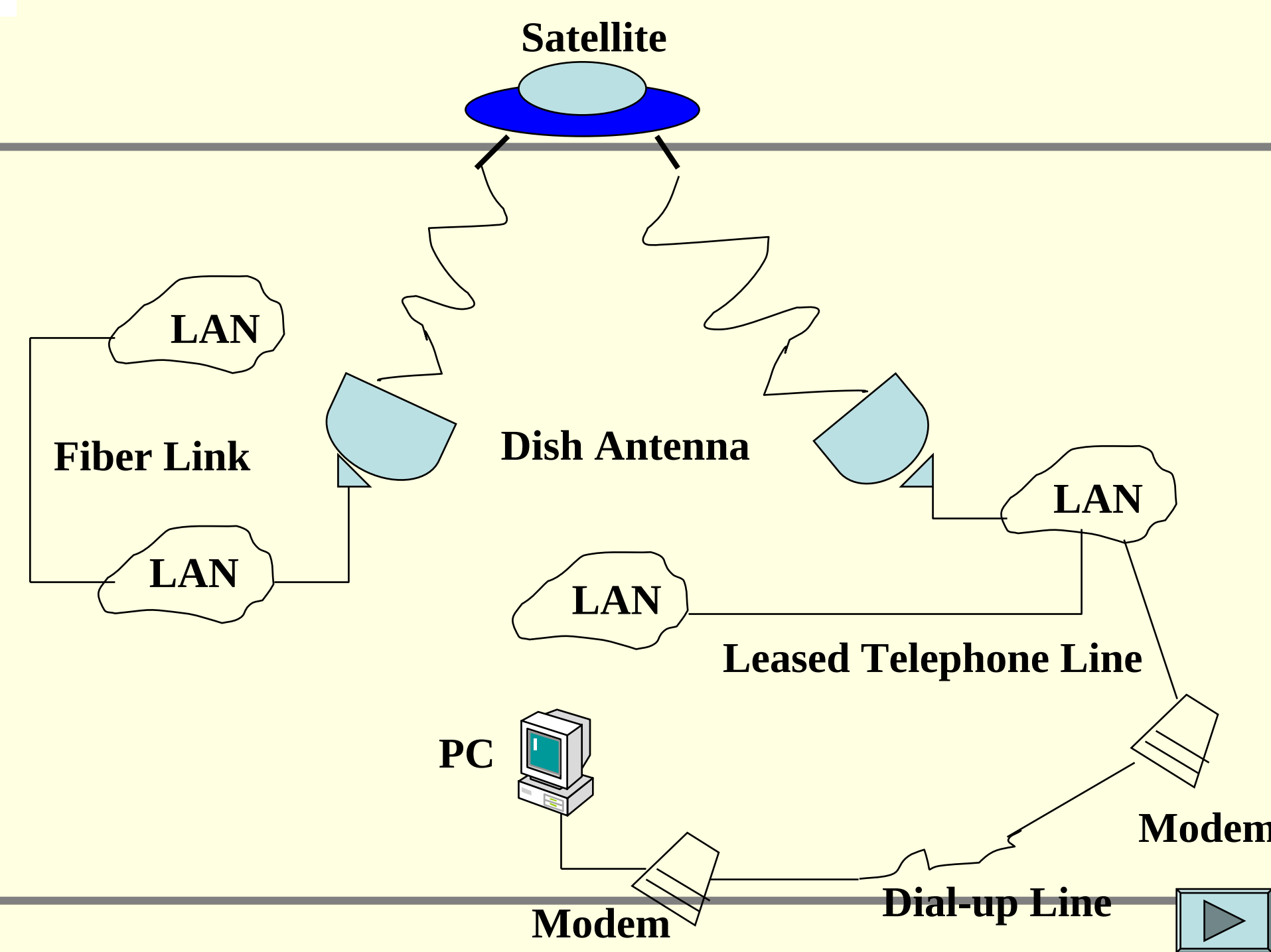
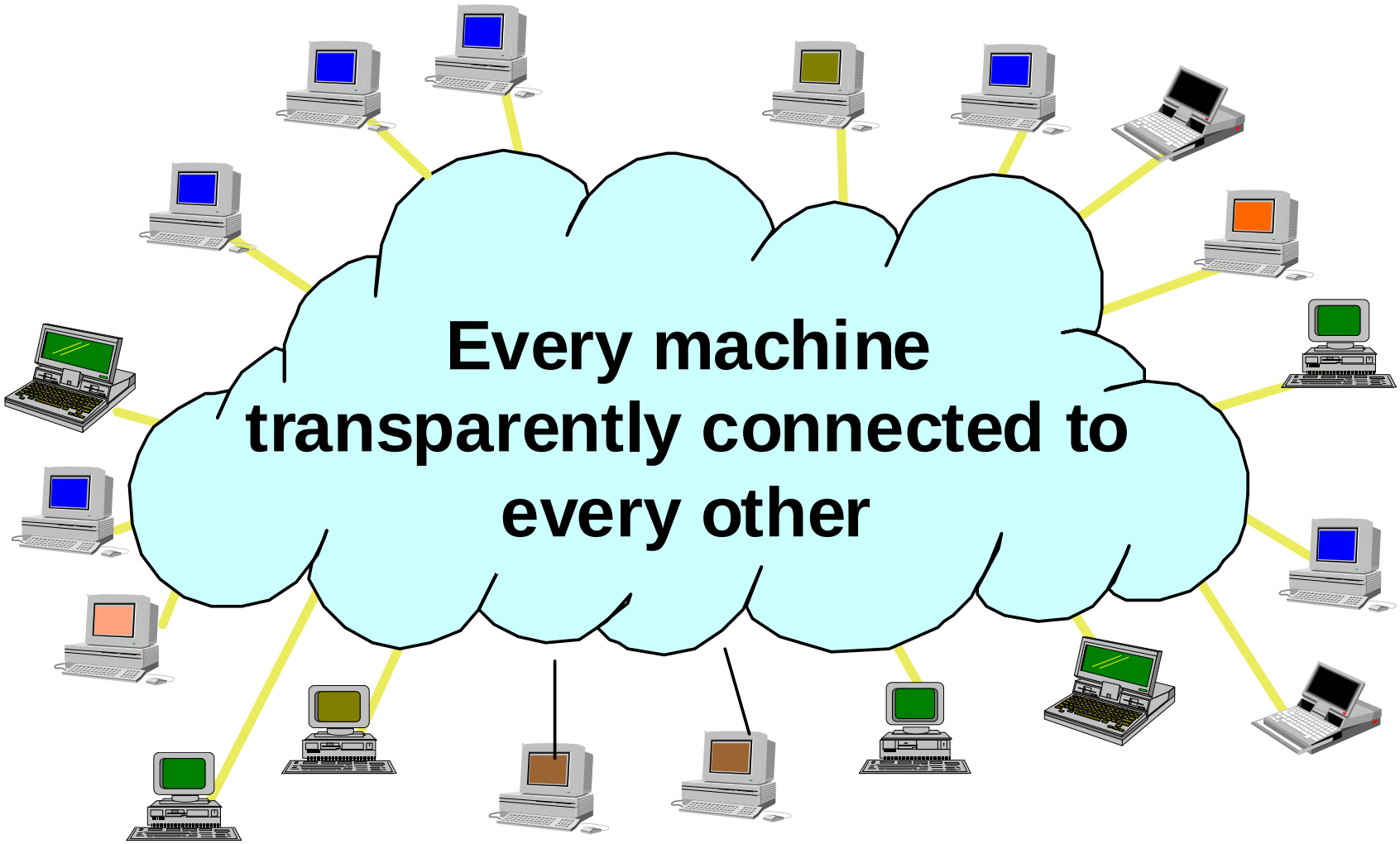
LANs

- A local area network is a group of computers and network communication devices interconnected within a limited area such as a building or a campus
- Local area network is less expensive and data transfer rate is quite high

WANs

- Wide area network interconnects LANs.Wide area network may be located around the world
- It is quite expensive as the technology required to connect different LAN's is more complex and sophisticated. Also the data transmission is more susceptible to errors in case of WANs as transmission is for long distances




Satellite
LAN
Fiber Link
LAN
Dish Antenna
LAN
LAN
Leased Telephone Line
PC
Modem
Modem
Dial-up Line

The Internet