Chapter 1
What is a computer?
The User’s View of a Computer System

- Application Software
  - Operating System Software
    - CPU & other Hardware
The User’s View
What is a computer?

A computer is an electromechanical device which can be programmed to change (process) information from one form to another.

**Electromechanical** - It runs on electricity and it has mechanical components.
The computer system

A computer system includes:

1. **Hardware** - the physical components which make up a computer system

2. **Software** (or programs) - the instructions that tell the computer what to do
The components of a computer system

Hardware Components
- the system unit
- the processor
- memory
- permanent storage devices
- input devices
- output devices

Software Components
- system software including operating system software
- application software
- development software
The Hardware Components of a Computer System
Examples of Hardware Components

- Input
- Processing
- Output
- Storage
Examples of Hardware Components
Some Simple Definitions

**application software** - software which lets the user accomplish a specific task like word processing, spreadsheets, or drawing pictures.
system software - software manages, controls, and maintains the computer

operating system software - system software which manages the overall operation of the computer system such as:

Windows 95/98  Macintosh OS
NeXT              Linux
Windows 2000   OS/2
Windows NT       Be
Windows ME       IRIX
Windows XP       UNIX
Solaris
Operating System
Software
Application Software
Types of computers

1. General Purpose Computers

2. Special Purpose or Dedicated Computers

3. Embedded Computers
1. General Purpose Computers - computers in which the user can modify the computer system, by adding additional hardware and especially software, in order to accomplish a variety of tasks

examples: supercomputers, workstations and microcomputers (PCs and Macs)
2. Special Purpose or Dedicated Computers - complete computer systems, with a specific purpose and perform only the task for which they were designed.

Examples: Game systems such as Sony Playstation, information kiosks.
3. Embedded Computers - computers which are found inside consumer goods in order to enhance them.

examples: VCR, Cell Phone
Categorizing computers by size and function

1. Supercomputer
2. Server
3. Workstation
4. Personal Computer (Microcomputer)
5. Terminal or Computing Appliance

*Some older terms: Mainframe, Minicomputer, Microcomputer*
Supercomputers

IBM BlueHorizion Supercomputer at the San Diego Supercomputer Center (at the University of California, San Diego) is the 52nd most powerful computer in the world.

(and one of the 10 most powerful in a University)
As of Jan 2003, #4 in world built by IBM
(at Lawrence Livermore National Laboratory)

1,000 times faster than Deep Blue
It’s the size of two basketball courts
8,192 copper processors
6.2 terrabytes of memory

12.3 trillion calculations/second (teraflops)
(translation: In one second it can solve what a human being with a calculator would take 10 million years)
about 1/5 the speed of current #1
Server

A Server is a machine that is designed to provide services for many people. Because it is typically more powerful than a desktop computer (in order to efficiently serve all of its clients), the term server has become synonymous with a powerful computer.

Dell PowerEdge 6650 Server  (from $5,499)
up to 4 processors
512MB to 32GB RAM
365GB or more storage
(this is not their “top of the line” product)
**Workstation** - A general-purpose computer designed to be used by one person at a time and which offers higher performance than normally found in a personal computer, especially with respect to graphics, processing power and the ability to carry out several tasks at the same time.

HP AlphaStation ES40 ($15,000)
- 4 64 bit processors
- 32GB RAM
Personal Computer –
A general-purpose single-user computer designed to be operated by one person at a time.
**terminal** (or Computing Appliance)
a minimal computer with a connection to another computer’s processor, storage and other devices.

WebTV appliance
This one from RCA has a msrp of $99.00
*hooks up to your TV and phone line*