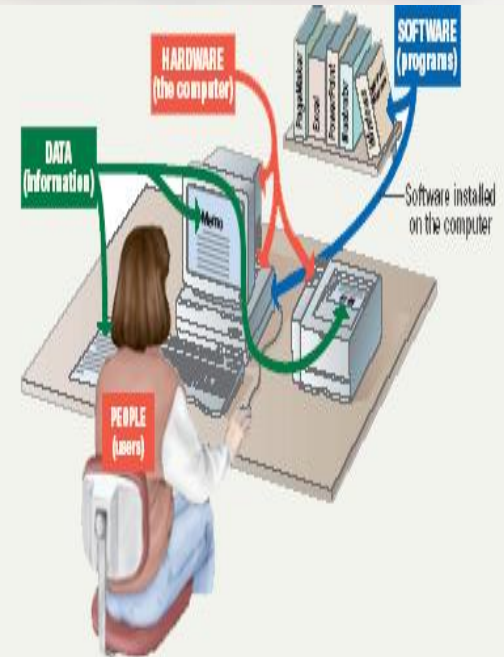# Chapter 1

Looking Inside the Computer System

In This Chapter

- What is computer system
- Classification of computers
- Computer system hardware
- Organization of computer system components
- Central processing unit
- Data representation

What is Computer?

- A computer is a fast and accurate electronic system that is designed and organized to automatically accept and store data, process them and produce output results under the direction of a detailed step-by-step stored program of instructions.

Classification of computers

- Size wise
- Structured wise
- Purpose wise
- History wise
- Speed – cost

According to Structure

- Digital computation
- Analog
- Hybrid

According to history

- ## First generation (von neumann machine)

  As far as general-purpose machines are concerned, the University of Pennsylvania is recorded to have hosted the building of the Electronic Numerical Integrator and Calculator (ENIAC) machine in 1944. It was the first operational general-purpose machine built using vacuum tubes. The machine was primarily built to help compute artillery firing tables during World War II.

According to history

- Second generation

The first major change in electronic computer comes with the replacement of vacuum tubes to transistors , transistors is cheaper , smaller.

- Third generation

Integrated circuit , it is a chip composed of a large set of transistors , capacitors, resistors

According to history

- Fourth generation

Large scale integrate circuits, better operating systems

- Fifth generation

Very large scale circuits ,object oriented programming, web applications, networks
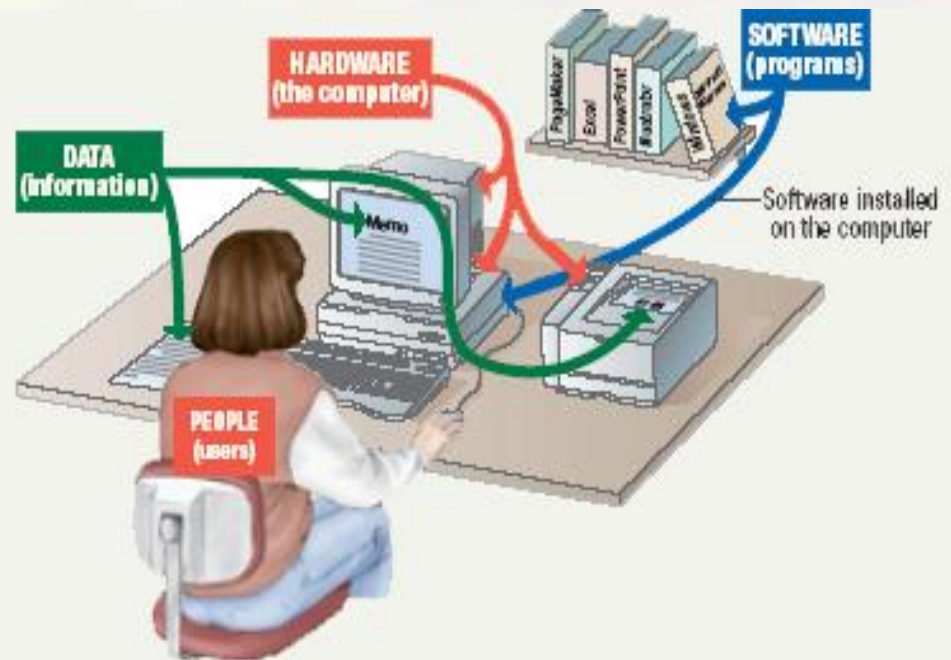
According to size

- Super computer
- Mini computer
- Mainframe
- Personal computer
  - Desktop
  - Handheld computers
  - Laptops

Parts of the Computer System

- Computer systems have four parts
  - Hardware
  - Software
  - Data
  - User
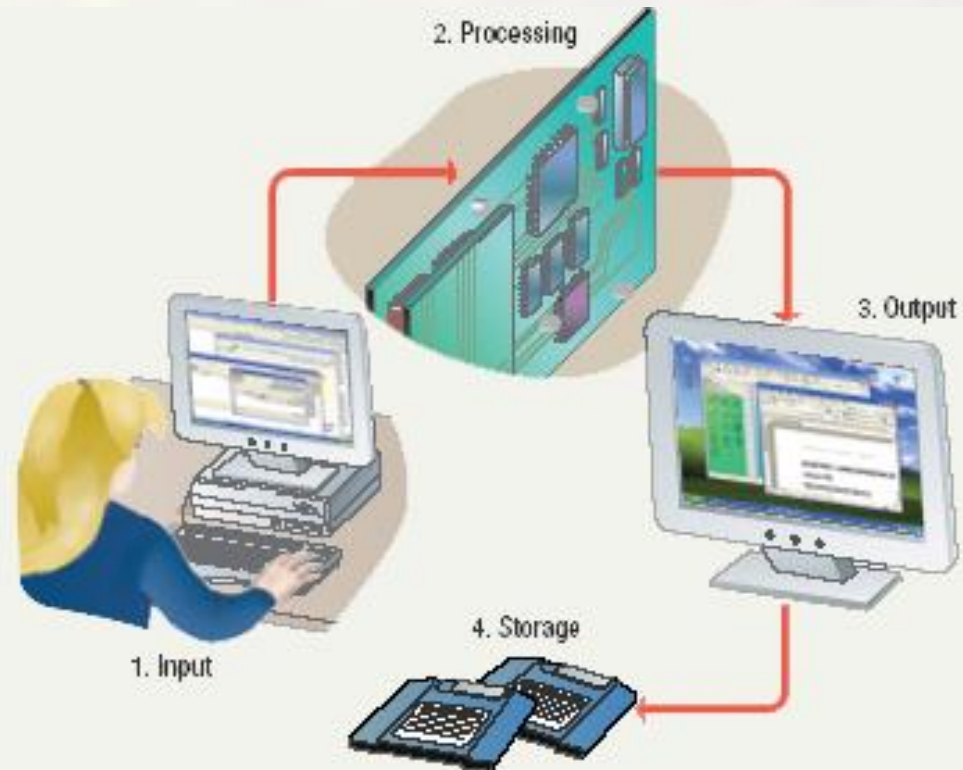
Parts of the Computer System

- Hardware
  - Mechanical devices in the computer
  - Anything that can be touched
- Software
  - Tell the computer what to do
  - Also called a program
  - Thousands of programs exist

Parts of the Computer System

- Data
  - Pieces of information
  - Computer organize and present data
- Users
  - People operating the computer
  - Most important part
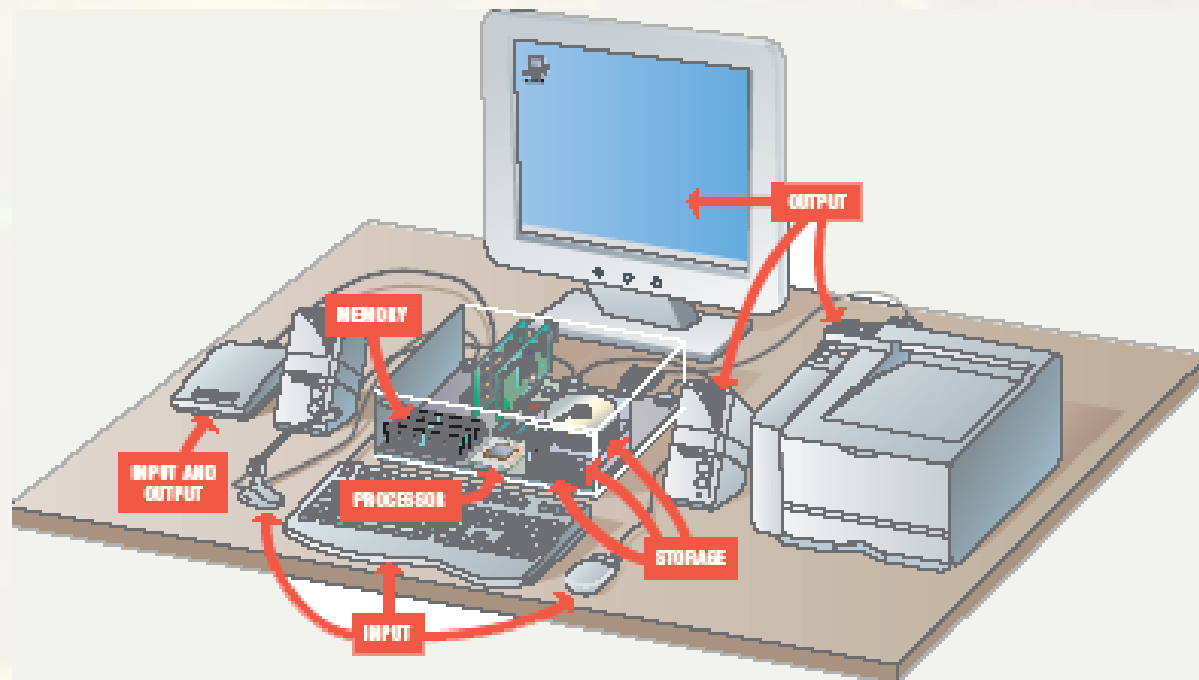 - Tell the computer what to do

Information Processing Cycle

- Steps followed to process data
- Input
- Processing
- Output
- Storage

Essential Computer Hardware

- Computers use the same basic hardware

- Hardware categorized into four types

Essential Computer Hardware

- Processing devices
  - Brains of the computer
  - Carries out instructions from the program
  - Manipulate the data
  - Most computers have several processors
  - Central Processing Unit (CPU)
  - Secondary processors
  - Processors made of silicon and copper

Essential Computer Hardware

- Memory devices
  - Stores data or programs
  - Random Access Memory (RAM)
    - Volatile
    - Stores current data and programs
    - More RAM results in a faster system
  - Read Only Memory (ROM)
    - Permanent storage of programs
    - Holds the computer boot directions

Essential Computer Hardware

- Input and output devices
  - Allows the user to interact
  - Input devices accept data
    - Keyboard, mouse
  - Output devices deliver data
    - Monitor, printer, speaker
  - Some devices are input and output
    - Touch screens

Essential Computer Hardware

- Storage devices
  - Hold data and programs permanently
  - Different from RAM
  - Magnetic storage
    - Floppy and hard drive
    - Uses a magnet to access data
  - Optical storage
    - CD and DVD drives
    - Uses a laser to access data

Software Runs The Machine

- Tells the computer what to do
- Reason people purchase computers
- Two types
  - System software
  - Application software

Software Runs The Machine

- System software
  - Most important software
  - Operating system
    - Windows XP
  - Network operating system (OS)
    - Windows Server 2003
  - Utility
    - Symantec AntiVirus

Software Runs The Machine

- Application software
  - Accomplishes a specific task
  - Most common type of software
    - MS Word
  - Covers most common uses of computers

Computer data

- Fact with no meaning on its own
- Stored using the binary number system
- Data can be organized into files

Computer users

- Role depends on ability
  - Setup the system
  - Install software
  - Mange files
  - Maintain the system
- "Userless" computers
  - Run with no user input
  - Automated systems

Chapter 1

Data representation

SELF-CHECK ::

Circle the correct answer for each question.

1. Any computer is controlled by _____ .

   a. hardware   **b.** information   **c.** instructions

2. Which of these is a powerful type of personal computer, favored by professionals such as engineers?

   a. workstation   **b.** notebook   **c.** mainframe

3. Which type of computer will you most likely encounter at the Department of Motor Vehicles?

   a. smart phone   **b.** mainframe   **c.** supercomputer

Multiple Choice ::

Circle the word or phrase that best completes each statement.

1. A computer converts data into this.
   a. information
   b. charts
   c. software
   d. input/output

2. The earliest computers were _____ systems.
   a. digital
   b. paper
   c. analog
   d. slide rule

3. Most computers are meant to be used by only one _____ at a time.
   a. company
   b. program
   c. organization
   d. person

4. Personal computers are also called _____ .
   a. minicomputers
   b. microcomputers
   c. maxicomputers
   d. supercomputers

5. Many scientists, engineers, and animators use specialized computers, called _____ .
   a. personal digital assistants
   b. minicomputers
   c. workstations
   d. networks

6. Notebook PCs fall into a category of devices called _____ .
   a. mobile computers
   b. small computers
   c. handheld computers
   d. minicomputers

7. Some notebook systems can be plugged into one of these devices, which give the computer additional features.
   a. port station
   b. network station
   c. workstation
   d. docking station

8. Some tablet PCs can be connected to a keyboard and a full-size _____ .
   a. computer
   b. monitor
   c. PDA
   d. workstation

9. Network servers are sometimes set up in groups that may be called _____ or server farms.
   a. units
   b. workgroups
   c. clusters
   d. racks

10. A(n) _____ terminal can perform some processing operations.
    a. system
    b. input/output
    c. computing
    d. intelligent

Review Questions ::

In your own words, briefly answer the following questions.

1. What is a computer?

2. Explain a few of the different ways in which computers can be categorized.

3. List six types of computers that are designed for use by a single person.

4. Describe the two common designs for desktop computers.

5. How much do notebook computers typically weigh?

6. List four types of computers that are designed for use by organizations, and are commonly used by multiple people at the same time.

7. Why are mainframe systems usually limited in the number of tasks they perform?

8. What is the most popular use for home computers?

9. How are computer technologies used by the military?

10. How are computer technologies being used to train surgeons?

Chapter 1

End of Chapter