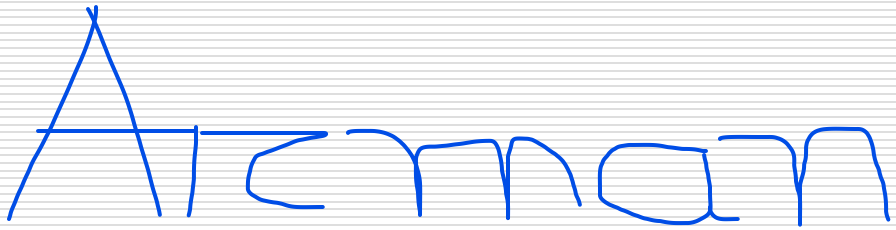


Lecture- 1

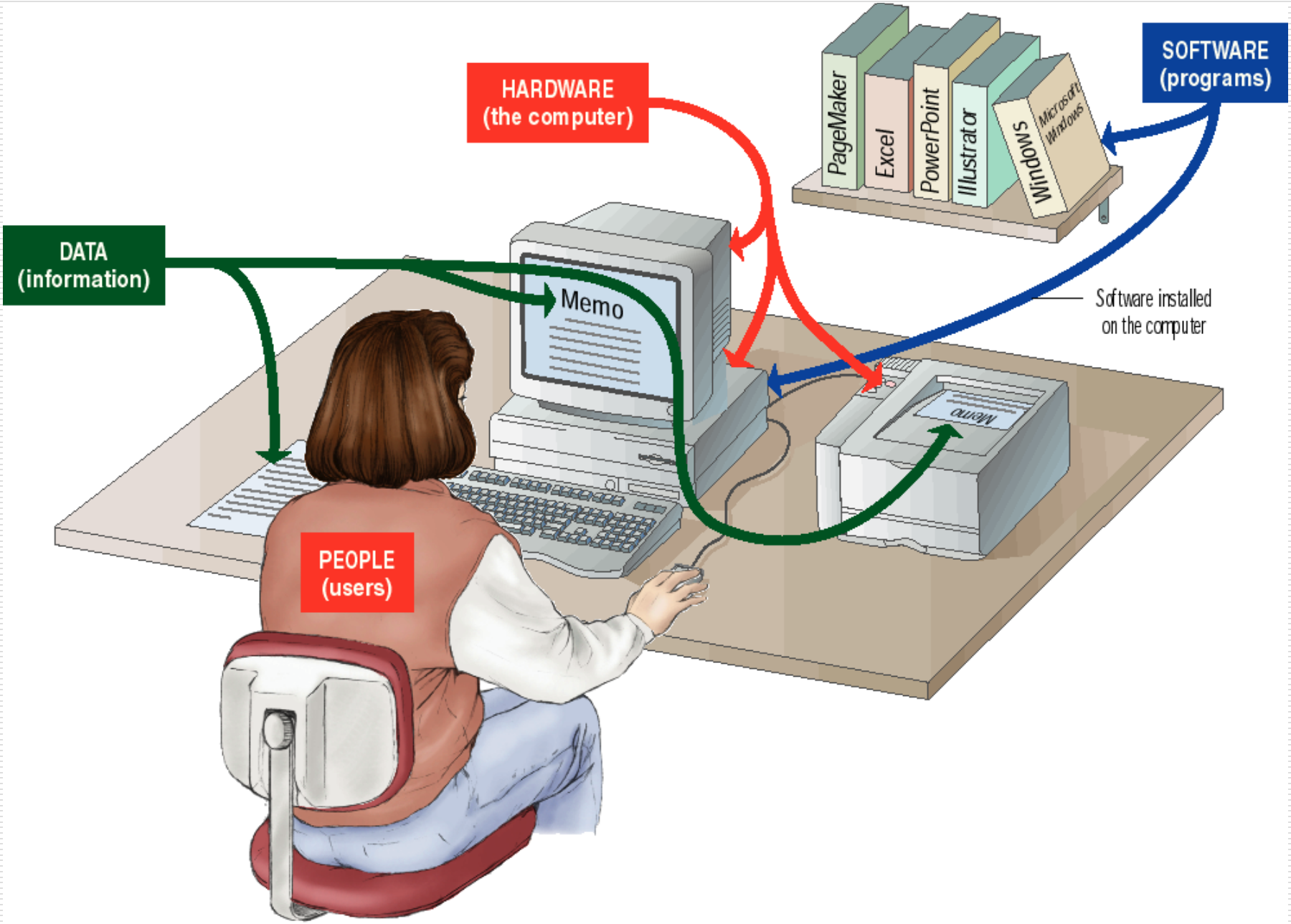
Introduction to Computers

What is a computer?

- A computer is an electronic device used to process data.
- A computer can convert data into information that is useful to people.
- A complete computer system includes four distinct parts:
  - Hardware
  - Software
  - Data
  - User

Data Processing

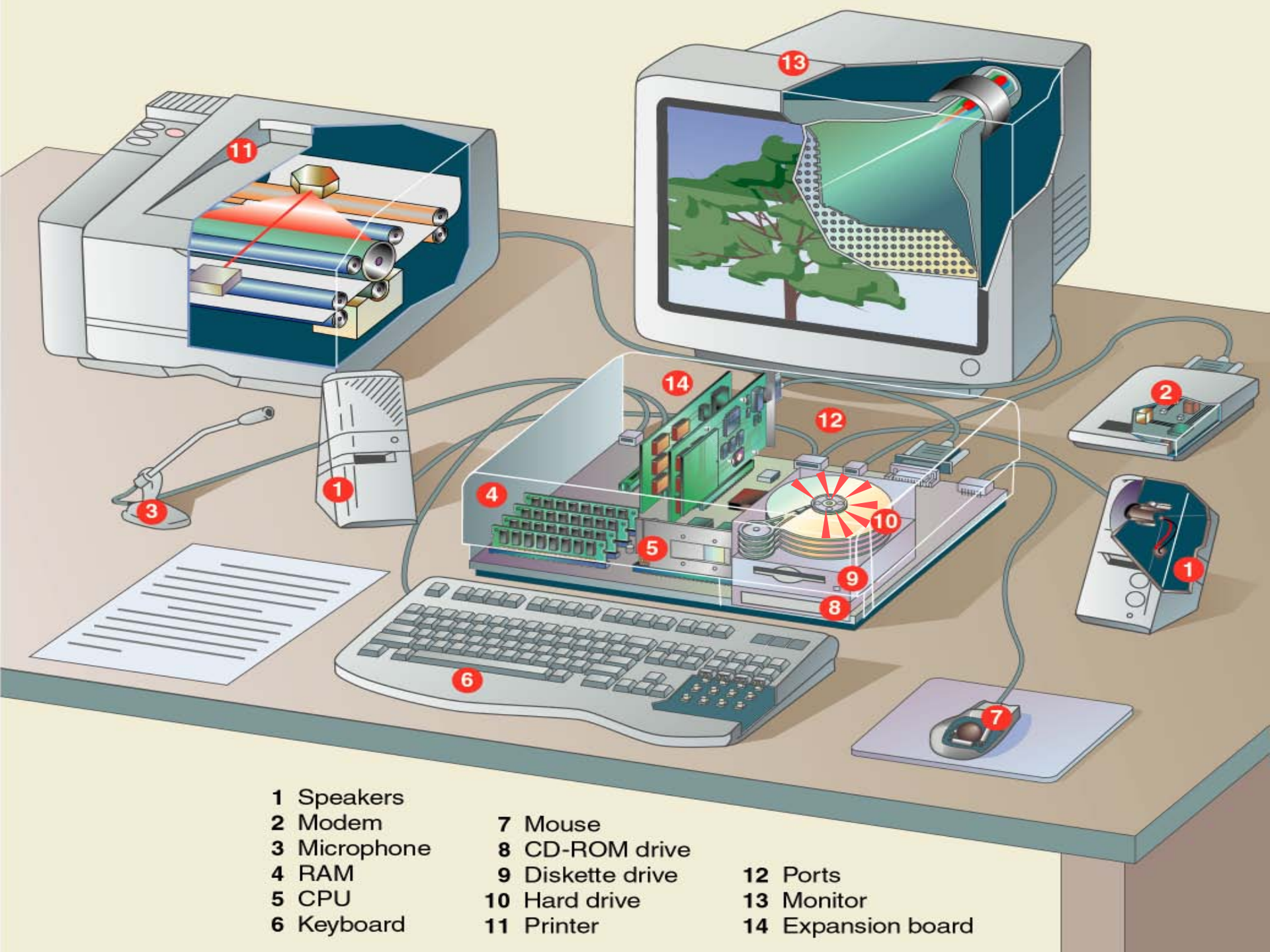
- The activity of processing data using a computer is called data processing.
- Data processing consists of three sub-activities:
  - Capturing the input data
  - Manipulating the data
  - Managing the output results
- In data processing, information is data arranged in an order and form, which is useful to the people who receive it.
- Data is the raw material used as input to data processing, and information is the processed data obtained as the output of data processing.


HARDWARE
(the computer)
SOFTWARE
(programs)
PageMaker
Excel
PowerPoint
Illustrator
Windows
Microsoft Windows
DATA
(information)
Memo
Software installed
on the computer
PEOPLE
(users)

Hardware

- A computer's hardware consists of electronic devices; the parts you can see and touch.

- The term "device" refers to any piece of hardware used by the computer, such as a keyboard, monitor, modem, mouse, etc.


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

Software

- Software – also called programs – consists of organized sets of instructions for controlling the computer.

- Software is a set of electronic instructions that tells the computer how to do certain tasks. A set of instructions is often called a program.

- When a computer is using a particular program, it is said to be running or executing the program.

Relationship Between Hardware & Software

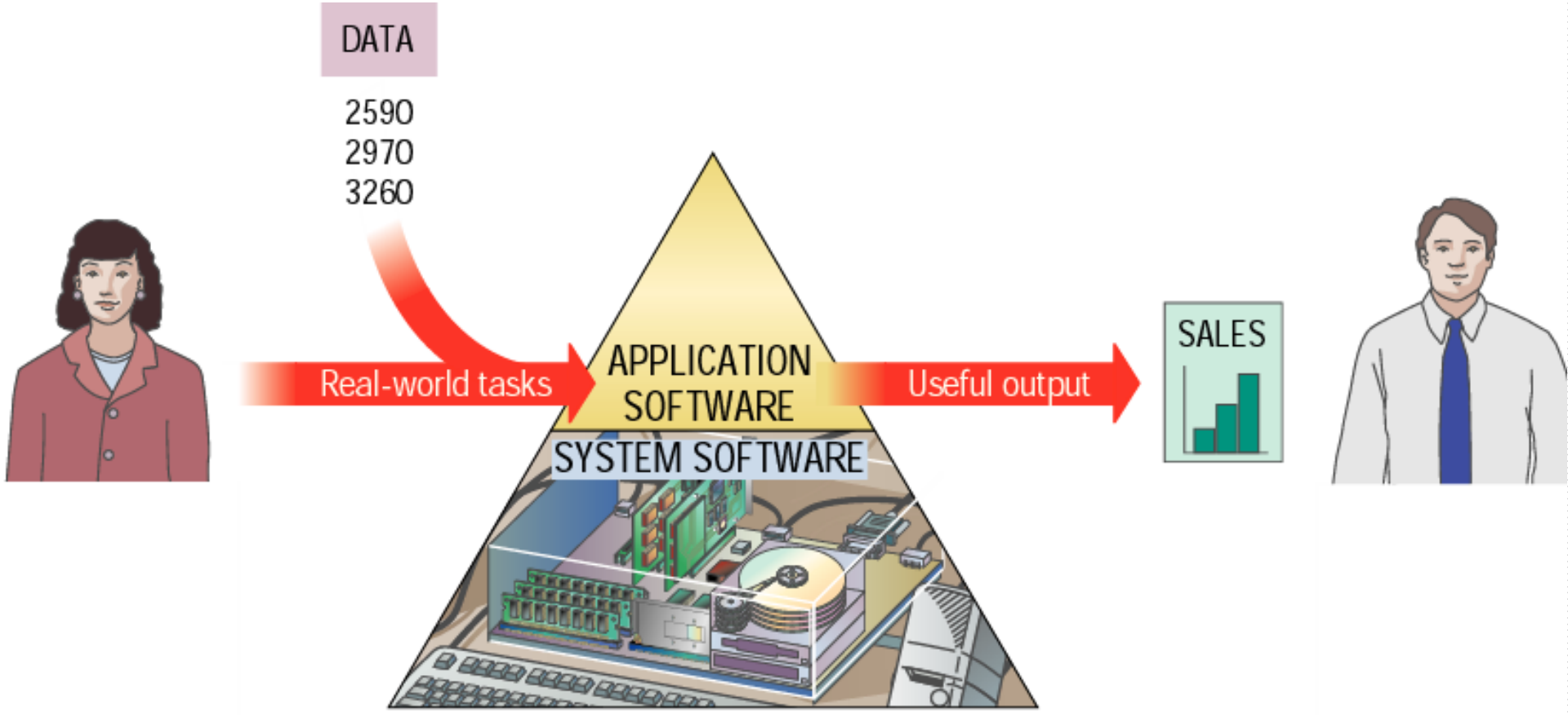
- Both hardware and software are necessary for a computer to do useful job. Both are complementary to each other.
- The same hardware can be loaded with different software to make a computer system perform different types of jobs.
- Except for upgrades, hardware is normally a one-time expense, whereas software is a continuing expense.

Types of Software

- The two most common types of programs are:
  - System software and
  - Application software.

- Some programs exist for the computer's use, to help it manage its own tasks and devices.

- Other programs exist for the user, and enable the computer to perform tasks for you, such as creating documents.


DATA
2590
2970
3260
Real-world tasks
APPLICATION SOFTWARE
SYSTEM SOFTWARE
Useful output
SALES

System Software

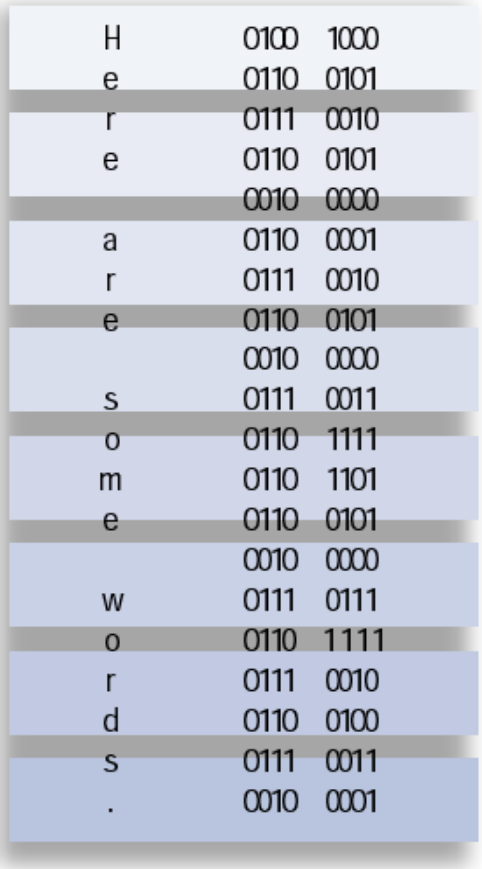
- System software exists primarily for the computer itself, to help the computer perform specific functions.
- One major type of system software is the operating system (OS). All computers require an operating system.
- The OS tells the computer how to interact with the user and its own devices.
- Common operating systems include Windows, the Macintosh OS, OS/2, and UNIX .

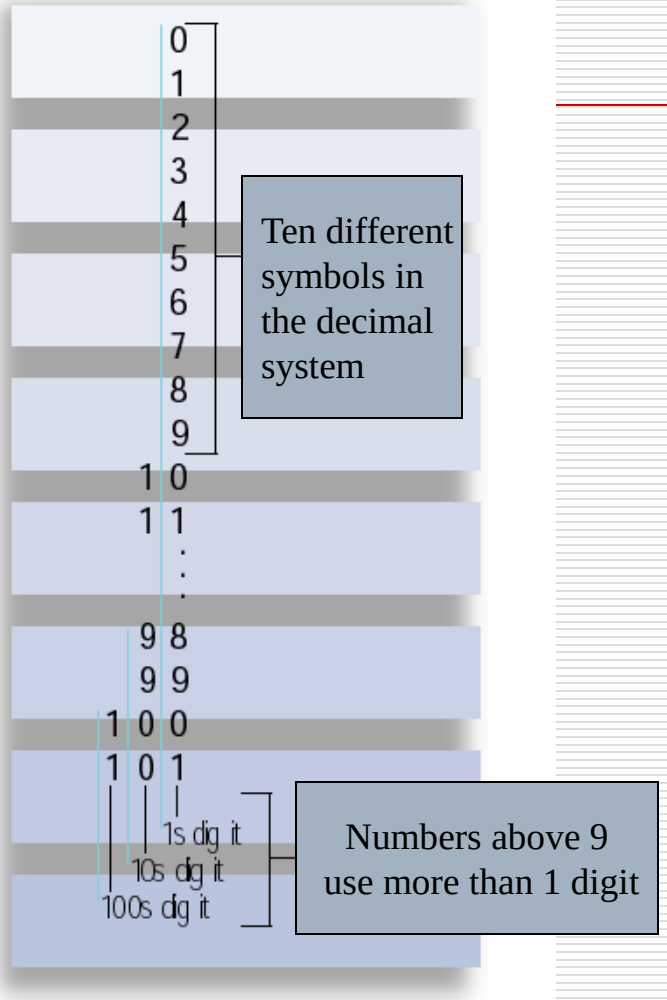
Application Software

- Application software tells the computer how to accomplish tasks the user requires, such as creating a document or editing a graphic image.
- Some important kinds of application software are:
  - Word processing programs
  - Spreadsheet software
  - Database management
  - Presentation programs
  - Graphics programs
  - Networking software
  - Web design tools and browsers
  - Internet applications
  - Communications programs
  - Utilities
  - Entertainment and education
  - Multimedia authoring

Data

- Data consists of raw facts, which the computer can manipulate and process into information that is useful to people.
- Computerized data is digital, meaning that it has been reduced to digits, or numbers. The computer stores and reads all data as numbers.
- Although computers use data in digital form, they convert data into forms that people can understand, such as text, numerals, sounds, and images.


H 0100 1000
e 0110 0101
r 0111 0010
e 0110 0101
0010 0000
a 0110 0001
r 0111 0010
e 0110 0101
0010 0000
s 0111 0011
o 0110 1111
m 0110 1101
e 0110 0101
0010 0000
w 0111 0111
o 0110 1111
r 0111 0010
d 0110 0100
s 0111 0011
. 0010 0001


0
1
2
3
4
5
6
7
8
9
10
11
98
99
100
101
1s dig it
10s dig it
100s dig it
Ten different symbols in the decimal system
Numbers above 9 use more than 1 digit

Users

- People are the computer's operators, or users.
- Some types of computers can operate without much intervention from people, but personal computers are designed specifically for use by people.
- Some computer systems are complete without human involvement but no computer is totally autonomous. It can do some tasks without a person sitting before it, but people still design, build, program and repair it.
- Human ware refers to the persons who design, program and operate computer.

Types of Users

- **System analyst:** The main tasks of a system analyst is to study information system and their processing requirements. He or she defines the application problem, determines system specifications, recommends the hardware and software and design.
- **Programmer:** The main requirement of a programmer is the knowledge of programming language and standard coding procedures. He or she only code or prepare programs based on the specification made by the system analyst. He does not require the broader understanding of the structure and inner working of the applications.
- **Operator:** He or she generally performs a series of tasks to keep the computer operating with maximum efficiency.

Characteristics of Computers

- Automatic
- Speed
- Accuracy
- Diligence
- Versatility
- Power of Remembering
- Volume of Data

Characteristics of Computers

- **Automatic:** A machine is said to be automatic, if it works by itself without human intervention. Computers are automatic machines because once started on a job, they carry on, until the job is finished, normally without any human assistance. But computer have to be instructed.
- **Speed:** A computer is a very fast device. It can perform in a few seconds, the amount of work that a human being can do in an entire year – if he worked day and night and did nothing else. The unit of speed of are the microseconds (10^{-6}), nanoseconds (10^{-9}), and even the picoseconds (10^{-12}).

Characteristics of Computers

- **Accuracy:** Computers are very accurate. The accuracy of a computer is consistently high, and the degree of accuracy of a particular computer depends upon its design. Errors can occur in a computer due to human rather than technological weaknesses.
- **Diligence:** A computer is free from monotony, tiredness and lack of concentration. It can continuously work for hours, without creating any error and without grumbling.
- **Versatility:** A computer is capable of performing any task, if the task can be reduced to a series of logical steps.

Characteristics of Computers

- **Power of Remembering:** A computer can store and recall any amount of information because of its secondary storage capability. Every piece of information can be retained as long as desired by the user, and can be recalled, as and when required. Even after several years, the information recalled would be as accurate as on the day when it was fed to the computer.
- **Volume of Data:** A computer can store very large amount of data depending on its secondary storage capability.

Limitations of Computers

- No I. Q.
  - Computers can not think
  - It cannot take any decision
  - It cannot do anything without human instructions

- No Feelings
  - No emotion because they are machines
  - Cannot make certain judgment in the day-to-day life because they can not take decision based on our feelings, taste, knowledge, and experience.
  - Their judgment is based on the instructions given to them in the form of programs that are written by us.