ENGINEERING COMPUTER PROGRAMMING
(INTRODUCTION TO COMPUTER)

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WHAT IS COMPUTER

A computer is an electronic device that can
- Receive information
- Perform processes
- Produce output
- Store info for future use
HARDWARE VS. SOFTWARE

Hardware – the physical parts that make up the computer
- CPU, memory, disks, CD-ROM drives, printer

Software – computer programs and applications
- Operating system, word processor, games, etc.
HARDWARE

- Monitor (output)
- Speaker (output)
- System unit (processor, memory...)
- Printer (output)
- Storage devices (CD-RW, Floppy, Hard disk, zip, ...)
- Scanner (input)
- Keyboard (input)
- Mouse (input)
WHAT ARE THE PRIMARY COMPONENTS OF A COMPUTER?

Input devices

Central Processing Unit
- control unit and arithmetic/logic unit

Memory

Output devices

Storage devices
INPUT DEVICES

Keyboard
Mouse
Microphone
Scanner
Camera
...

[Image of input devices]
The central processing unit (CPU) is the “brain” of the computer.

- Interprets instructions to the computer (control unit)
- Performs the arithmetic and logical processing (ALU)
Memory, also called Random Access Memory or RAM, stores:

- Instructions waiting to be executed
- Data needed by those instructions
- Results of processed data

Any information stored in RAM is lost when the computer is turn off.

Data in memory is stored as binary digits (bits) e.g. 011100011010

1 BYTE = 8 bits

1 byte usually stores 1 text character
AMOUNT OF RAM IN COMPUTERS

We measure the size of memory by telling how many bytes it can hold:

- 1 kilobyte = \(2^{10}\) bytes = 1024 bytes
- 1 megabyte = \(2^{20}\) bytes = \(\sim\)1 million bytes
- 1 gigabyte = \(2^{30}\) bytes = \(\sim\)1 billion bytes
- 1 terabyte = \(2^{40}\) bytes = \(\sim\)1 trillion bytes

- One megabyte can hold approximately 500 pages of text information
OUTPUT DEVICES

Output devices make the information resulting from the processing available for use

- Printer – produces a hard copy of your output
- Screen – produces a soft copy of your output
- Speaker, etc.
STORAGE DEVICES

Auxiliary storage devices are used for permanent storage of data
  • Hard disks
  • Floppy disks
  • Compact discs – CD and DVD drives
  • Flash cards
HARD DISKS

Permanent storage that is inside of the computer and not portable
Consists of several platters which spin very fast
Typical hard disks range from 300GB to 10Tera
COMPACT DISKS

CD-ROM (read only memory)
CD-RW (rewritable)
DVD-ROM
DVD+RW

Typical CD’ can store about 700MB
Typical DVD’ can store up to 17GB
FLASH CARDS

Advantages:

- Small, easy to carry around
- High memory capacity – up to 128GB

Note

- There are several different factors of flash cards, including Compact Flash, SmartMedia and PCMCIA
SOFTWARE

A computer program or software tells it exactly what to do
A computer program is a set of instructions to the computer
The computer does one instruction at a time
SOFTWARE

Computer software is the key to productive use of computers. Software can be categorized into two types:

- System software
- Application software
SYSTEM SOFTWARE

The most important system software is the operating system
- Windows, DOS, Apple, Unix, Linux

An OS is a computer program that
- Controls the hardware of the computer
- Enables you to communicate with the computer
Application software consists of programs that tell a computer how to produce information. Some of the more commonly used packages are:

- Word processing
- Electronic spreadsheet
- Database
- Presentation graphics