Hardware & Software

-The two essential components of every computer

Hardware:
- the physical, tangible parts
- EX: keyboard, monitor, wires

Software:
- programs and data

Hardware Components

- I/O Devices:
  - Monitor
  - Keyboard

- Central Processing Unit
  - chip that executes program commands
  - known as the CPU
  - EX: Pentium, PowerPC

Secondary Storage Devices
- Hard Disk

Main Memory
- Input
- Output
Main Memory

- primary storage area for programs and data in active use
- known as RAM
- volatile: stored data disappears when power is turned-off

Secondary Storage Devices

- non-volatile: provides long-term storage
- data moved to/from RAM as needed
- EX: hard disk, DVDs, USB stick

Input/Output Devices

- allow user interaction
- usually called I/O Devices
- EX:
  - input: keyboard, mouse
  - output: monitor, printer

Hardware Components
Data Storage

- The CPU, RAM, and Secondary Storage Devices consist of electrical circuits
- A single electrical circuit can be in one of two possible states
  - EX: a light switch can be "on" or "off"

A single electrical circuit can store one bit of information
- bit is short for "binary digit", meaning a digit with two possible values
- in computer science we label these values 1 (one) and 0 (zero)
- bits are the basic units of information on a computer

Strings of Bits

- Computers store and manipulate all data as strings of bits
- Complex data (EX: images) require lots of bits to represent
- So bits are usually manipulated in larger units

Bytes

- 8 bits are called one byte
  - Smallest unit usually manipulated by the computer
- Larger groupings of bytes:
  - one megabyte (MB) is about one million bytes
  - one gigabyte (GB) is about one billion bytes
Storage Capacity

✴ The storage capacity is the amount of data that a storage device can hold

✴ The storage capacity of Main Memory and Secondary Storage Devices is usually given in MB's or GB's

• EX: a 500GB Hard Drive can store about 500 billion bytes of information

Software

✴ Programs & Data

✴ Program: a series of instructions to the computer

✴ Data:
  • information that programs operate on
  • EX: numbers, text, images

Primary Categories of Software

✴ Operating System
  • controls machine activities
  • provides user interface to computer
  • EX: Vista, MacOS X, Linux

✴ Application
  • generic term for all other software
  • EX: word processors, games

Module 2 Vocabulary

hardware  byte
software  megabyte
central processing unit (CPU)  gigabyte
main memory (RAM)  storage capacity
secondary storage devices  program
I/O devices  data
bit  operating system
application
Questions?

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