

CSCI 100

Computing A

Lecture 1 - Introduction
Week 1

Computer Systems

A computer processes data by following instructions in a computer program. A computer system requires:

computer hardware and
computer software

Computer Classification

Computers are generally classified according to their size, speed, processing capabilities and price, eg.

- Personal computer
- Server computer
- Minicomputer
- Mainframe
- Supercomputers

Personal Computer

- **also called a microcomputer**
- **small system used by one person**
- **generally priced under \$10,000.**

eg. notebook, laptop, desktop, and tower systems.

Server Computer

- designed to support a computer network
- allows shared software and hardware
- powerful CPU,
- large RAM and disk storage
- high-speed communication capabilities.

Minicomputer

- More powerful than a personal computer
- Supports multiple users performing different tasks
- Businesses and organisations use minicomputers
- Price range is approximately \$10,000 to \$200,000.

Mainframe Computer

- » Large systems that can handle many users
- » Stores large amounts of data
- » Processes transactions at high speed
- » Price range: \$100,000 to \$10,000,000.

Supercomputers

- » The most powerful category of computers
- » used for weather forecasting, space exploration, etc
- » Price: several millions of dollars.

Microcomputer Classifications

- » Classified according to the manufacturer or compatibility.
- » At Wollongong University there are three main types of microcomputers:
 - » (i) Macintosh computers (MACs)
 - » (ii) IBM compatible computers (PCs)
 - » (iii) SUN workstations (UNIX)
- » Note: there are many other "types" of microcomputers

PC Classifications

PC's are often identified by their processor. eg.

- **286 (or 80286)**
- **386 (or 80386)**
- **486 (or 80486)**
- **Pentium**
- **Pentium II**
- **Pentium III**

Standalone vs Networked Systems

Microcomputer systems may be used as standalone systems or networked systems:

(i) Standalone - a single computer with a monitor keyboard, etc.

(ii) Networked - interconnected via cable

COMPUTER SOFTWARE

- » Programs that contain computer instructions
- » Usually stored on magnetic or optical disks
- » Programs must be transferred from disk to the memory to be executed

Computer Software Classifications

- (i) Application Software - programs designed for a specific a purpose eg. Word, Excel).
- (ii) System Software - The operating system. Acts as an interface between the user, the application programs and the computer equipment. (eg MS-DOS, Windows 95, MacOS, UNIX)

VERSIONS OF SOFTWARE

(a) Operating systems **are** continually being upgraded.

MS-DOS V3

MS-DOS V6,

MS-DOS V6.3.1

Windows 3.1

Windows 95

(b) Application software must be compatible with the operating system and computer hardware

Some applications require fast CPU, more RAM and hard disk space

PROGRAM FILE vs DATA FILES

- » **A program file is executable** - it contains instructions for the CPU to execute.
- » **A data file** is usually produced by another program. (eg Word document)
- » The format of a data file is determined by the program file that produces the data file.
- » eg. MS Word 6 won't open a Word 97 document file

Note: Many student PCs on campus still have Word 6. Thus, your Office 97 files may have to be converted to work on them at Uni.

FUNCTIONS OF A COMPUTER SYSTEM

The functions of a computer system consists of four main areas of data handling -

- * input of data**
- * processing data**
- * output of data**
- * storage of data**

INPUT OF DATA

- **An input device (eg keyboard, scanner) accepts data from outside the computer system and converts it into electrical signals. The input data is placed directly into main memory.**

PROCESSING OF DATA

- **main activity of the computer.**
- **carried out by the central processing unit (CPU).**
- **The CPU must communicate with main memory in order to process data.**

OUTPUT OF DATA

- **Processed data is taken from main memory and made available to users via output devices (eg display, printer).**
- **Note input and output devices are often called peripheral equipment because they are located outside the central part of the computer.**

STORAGE OF DATA

- Data and computer programs not currently being executed are stored as computer files -
- these files are usually stored on magnetic disk or tape.
- Example of storage devices: disk drive, tape drive
- Example of storage medium: magnetic disk, magnetic tape, optical disk.

COMPUTER CHIPS

- are silicon chips or integrated circuits
- designed for specific purposes eg. ram chips, rom chips and cpu chips.
- A microprocessor chip is a specialised chip found in microcomputers (and other electric devices).

RAM chips

- Random Access Memory
- Programs and data are temporarily stored in the RAM chips.
- Volatile storage
- Data is lost when the computer is turned off

ROM chips

- Read Only Memory
- Data is permanently stored in the ROM chips when the chips are manufactured.
- Data can be read from the ROM chips, but cannot be written to the ROM chips
- ROM is non-volatile storage - used to store special programs and data needed for the basic operation of the computer.

BOOTING THE SYSTEM

- Booting the system loads operating system into RAM chips
- The startup (or boot) program is permanently stored in the ROM chips.
- When the computer is turned on, the boot program instructs the CPU to load the operating system from the hard disk into the RAM chips.

FLOPPY DISKS

Formatting a disk involves:

- defining tracks and sectors on the surface.
- establishing the directory of the disk.
- In Windows 95 the FORMAT command is within the WINDOWS EXPLORER program.

CARE OF FLOPPY DISKS

- Don't touch disk surface
- Handle disk gently
- Avoid risky physical environments
- Discard a disk if the shutter becomes loose!
- Always have a backup copy of your important work!