Introduction to computer

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Unit – 5

Introduction to Computers

- A computer is a key component in information system.
- A computer is a digital electronic machine that can store and process data.
- In other words computer is an electronic device, which performs arithmetic and logical calculations both with speed and accuracy.
- Characteristics of computer are speed, automation, diligence, accuracy etc.
- It can be operated by giving instructions.
- Computers can be connected with each other and can share information.
- The set of instructions is called program
- To computer, we need to attach different input / output devices such as keyboard, screen and printer. Storage devices are used to store information.

Types of Computers

- Computers are classified into 4 categories.
- **1) Super Computers** –
- Most powerful type of computer.
- High capacity computers used by very large organizations.
- For Ex. NASA uses supercomputer to track and control space explorations
- **2) Mainframe Computer** –
- Are not powerful as supercomputer.
- Are capable of great processing speed and data storage.
- For example insurance companies uses mainframes to process information about millions of policyholders.
- **3) Mini Computer** –
- Are desk-sized machines.
- Medium sized companies or departments of large companies use them for specific purposes.
- **4) Microcomputers –**
- Although least powerful, microcomputers are the most widely used and fastest growing type of computer.
- Categories of microcomputer includes –
- Desktop computer - small enough to fit on top of or along the size of desk.
- Notebook computers – are portable and fits into most briefcases.
- Personal digital assistant (PDA) – Also called palmtop or handheld computers.

A) Components of a Computer System

- The components of a computer system are –
- Hardware
- Central Processing Unit (CPU)
- Main Memory
- Input Devices
- Output Devices
- Monitor
- Software

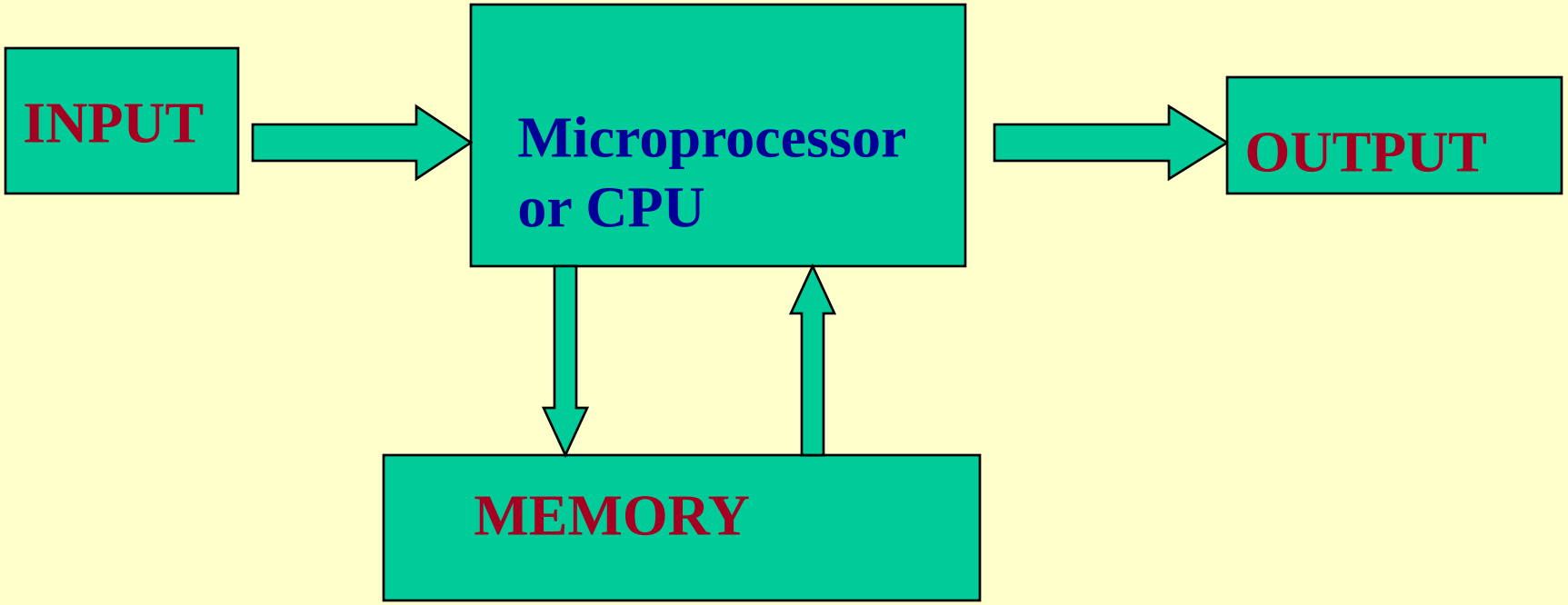

FIG - BLOCK DIAGRAM OF DIGITAL COMPUTER

CENTRAL PROCESSING UNIT (CPU)

- CPU is a heart of computer.
- CPU is fabricated in the form of an integrated circuit & located on the microprocessor chip.
- CPU performs actual calculations, makes decisions & guides the machine in all of its operations.
- CPU has two main components- the Control Unit (CU) and the Arithmetic Logic Unit (ALU).
- CPU also possess small set of storage areas, called registers.
- CU controls all the operations performed by a computer. It directs the movement of electronic signals between memory and ALU. It also controls the flow of data between the CPU and peripherals (input & output devices). The control unit tells the rest of the computer how to carry out program instructions.
- ALU is the primary processing unit in a computer. It performs all the arithmetic operations such as addition, subtraction, multiplication and division. It also performs logical operations such as comparing data to see if one is equal to (=), less than (<) or greater than (>) other. Results are either stored in memory or registers.

Input Devices

- Computer can process huge amount of data.
- The first step in data processing is to fed (enter) necessary data into the computer.
- The devices through which the data are entered into the computer are called input devices.
- Input devices are used to enter data into computer so it can be processed.
- Computer can not understand human readable language constructed of letters, numbers and punctuation marks. However, computer can understand only the binary machine language of 0s & 1s.
- Input devices translates data and program that human can understand into a form that the computer can process.
- Input devices transfer information from the outside world into the memory of a computer system.
- Examples : Keyboard, Mouse, Floppy Disc Drive, Hard Disk Drive, Scanner, Modem, Speech Recognition Devices etc.

Output devices

- Output devices translates the processed information from computer into a form that human can understand.
- In other words, output devices converts machine information into people readable information.
- Output devices transfer information from the memory of a computer system into the outside world.
- They are used to display data.
- Output devices are used to get processed data out so we can see it or distribute it to others.
- Examples : Monitor, Printer, Plotter, Magnetic Tape, Hard Disc Drives, Floppy Disc Drives etc.
- Some devices are two way in nature, they are able to both input and output information.

Monitor

- This is the most frequently used output device.
- Monitor is like a TV screen.
- The results of instructions (processed information) given to the computer are seen on the screen.
- Two important characteristics of monitor are size & clarity.
- A monitor's size is indicated by the diagonal length of its viewing area.
- Common sizes of monitor are 15, 17, 19, 21 inches.
- A monitor clarity is indicated by its resolution, which is measured in pixels.
- Pixels are individual dots or "picture elements" that form a images on a monitor.
- Greater the pixels, the better the clarity of the image.

Software

- Computer is an electronic machine consisting of physical equipments called hardware.
- In order to get work done from this hardware, a user has to issue appropriate and precise instructions. This set of instructions that tells computer what to do and when to do is called software or programs.
- More precisely software are instructions that tells the computer how to process data into information.
- There are two major kinds of software used in computer.
- 1) System software
- 2) Application software

System Software

- It is a program that enables the application software to interact with computer hardware.
- It is a programs that support the execution and development of other programs.
- System software enables the computer to
- 1) Boot-up when the power is given.
- 2) Understand the various commands given by the user.
- 3) Effectively interact with the user to get the job done.
- Examples : Operating system such as Windows 95, Windows 98, Windows NT, Windows 2000, Linux, UNIX, etc.

Application Software

- Application software is a "end-user" software that performs useful work on general purpose tasks such as word processing and data analysis.
- It enables the user to implement specific applications such as -
- Word-processor – prepare written document
- Spreadsheet programs – analyze & summarize numerical data.
- Database management system (DMS) – organize & manage data & information.
- Browser – navigate, explore and find information on the internet.
- Presentation graphics – communicate a message.
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B) Memory Concept

- Memory is an essential component of a digital computer.
- Memory stores programs, data and results and provides that information to the CPU whenever necessary.
- Memory transfer results to the output devices or stores in memory for later use.
- A computer uses a number of memory devices such as semiconductor memory, magnetic memory and optical memory.
- The speed of the memory should be very high & must match the speed of the CPU.

• Cache Memory –

- In certain systems, the speed of the primary memory may be much slower than the speed of CPU.
- In such conditions, CPU, has to wait for the primary memory to send or receive data. This wait time reduce the processing speed of the computer. To match the speed of the CPU a very fast semiconductor memory called cache memory is directly connected to CPU.
- It is a very fast semiconductor memory used to match the speed of the CPU.
- It is directly connected to the CPU.
- It stores currently needed instructions and data of a program being executed.
- Its access time is 10 ns.
- It uses static RAMs.

- Classification of Memory:

- 1) Primary Memory
- 2) Secondary Memory

- Primary Memory (Main Memory) –

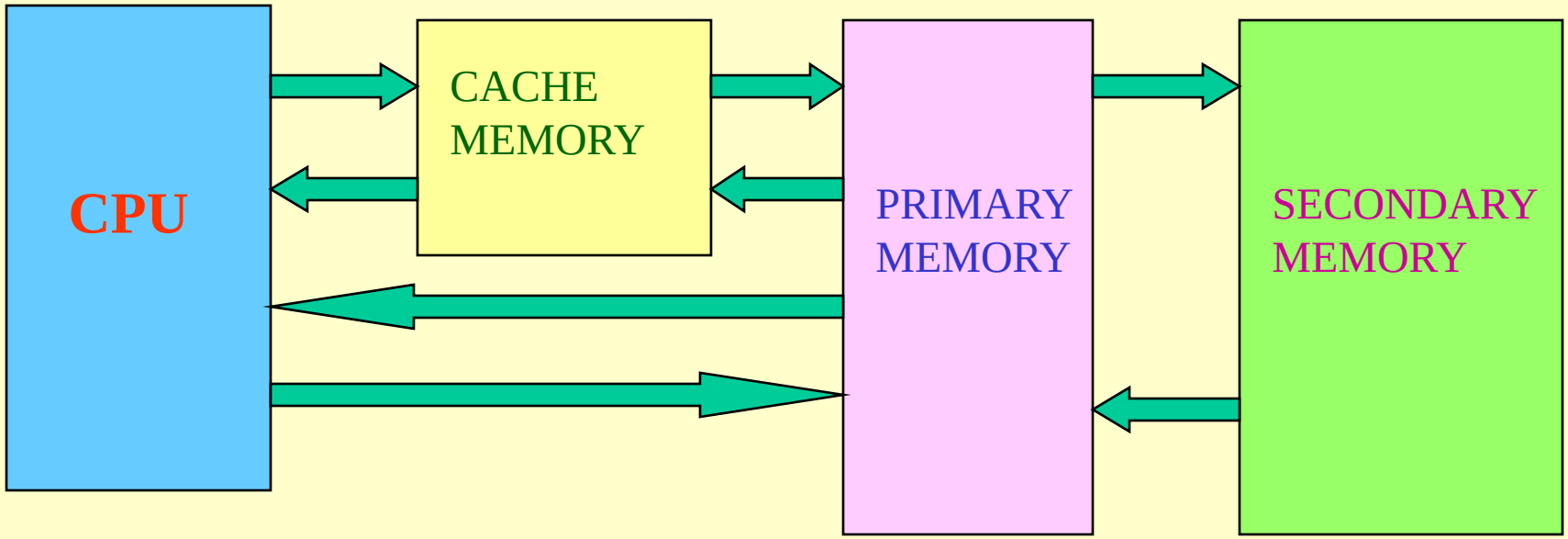
- Register memory is not sufficient in most systems. Thus, for program and data storage the primary memory is used.
- It is fast semiconductor memory.
- It stores programs & data, which are being processed by the CPU.
- Its access time is about 50 ns.
- It uses dynamic RAMs.
- It is cheaper than cache memory.
- Its storage capacity is less than secondary memory.
- It is connected to the cache memory.
- It's a volatile memory & holds programs, data & results as long as power supply is on.
- Primary memory uses following types of semiconductor memories.

Semiconductor Memory

- There are two main types of semiconductor memory : RAM and ROM
- RAM
- It is Random Access Memory.
- This memory can perform both read and write operations.
- RAM is volatile memory. It stores information as long as power is supplied to it. Its contents are lost when power is switched off.
- In RAM, any memory location can be accessed in a random way. The access time is same for each and every location.
- There are two types of RAM: Static RAM (SRAM) & Dynamic RAM (DRAM).
- ROM
- It is Read Only Memory to which it is not possible to add anything new.
- ROM is a non-volatile memory. Its contents are not lost when its power supply is switched off.
- ROMs are permanent type memory. It is simple, cheap and dense.
- It is not accessible to user, and hence one can not write anything into it.
- Its contents are written at the time of its IC fabrication.
- ROM is used to store permanent (fixed) programs.
- It uses one-transistor memory cell.
- The different types of ROMs are : PROM(Programmable Read Only Memory), EPROM (Erasable Programmable Read Only Memory), EAROM ((Electrically Alterable Read Only Memory).

- ## Secondary Memory (Auxiliary Memory)
- It is a long-term and non-volatile memory & stores information permanently.
- The secondary memory is a mass storage device & supplements the main memory.
- Secondary storage devices are also useful in transferring data or programs from one computer to another.
- It also allow to back-up the valuable information. If computer crashes by accident data can be restored from your back-ups.
- It stores operating system, compilers, assemblers, application programs, etc.
- Programs, data and results are saved on secondary memory.
- Magnetic and optical memories are permanent secondary memories and are cheaper and slower than semiconductor memories.
- The access time of magnetic disks is about 5-10 ms, while access time of optical disks is about 80 ms.
- Examples – Floppy disk, Hard Disk, Magnetic tapes, Magnetic disks, optical disk (Compact Disc) etc.

Connection of different types of memory.



- Cache memory is directly connected to the CPU.
- The main memory is connected to the cache as well as the CPU.
- The secondary memory is connected to the main memory.
- CPU does not read data from or write data to the secondary memory directly.

D) MS - Word

- Microsoft office suite is a collection of Word, Excel, Power point & some other useful programs.
- Word was first developed by Microsoft in 1984.
- Word program is used for word processing.
- we can create, save, edit and print a document with the help of this program.
- Features of Word
- Various fonts are available in a Word
- Font of letters can be changed in a document.
- Creation of a table in a document.
- Mathematical formulas can be written in a document.
- Facility to create charts in a document.
- Facility to include pictures, images, bottom note in a document.
- Facility to send letters to several peoples.
- Facility to check spelling and grammar of text.
- The incorrect spellings can be corrected.
- A document can be formatted in various ways.

Creation of document in Word

- To create a document start word program as follows.

Choose Start ⟶ Programs ⟶ Microsoft Word.

- Initial screen of word opens. Screen shows
- Title Bar – Shows the name of the document.
- Menu Bar – Shows the commands of menus such as file, edit, view, insert, format, tools, table
- Formatting Tool Bar– Provides access to assorted commands such as font type, font size, bold, italic, underline, alignment etc.
- Standard Tool Bar – also provides access to other assorted commands
- Screen shows maximize, minimize, and close buttons to resize or close the word window.
- Vertical scroll bar to move backward and forward in document.
- Horizontal scroll to move from side to side in a document.
- Status bar – display information about the position of insertion point & about the document in the window.
- The normal view button, web layout button, print layout view button, & outline view button changes the view of the document.
- The next page and previous page button displays the next page and previous page of the document.

- **Entering text** –
- To enter text into your document, position the insertion pointer where you want the text.
- Type in text.
- Word automatically wrap text as it reaches end of line, so you need not to press enter key.
- Press enter key when you need to start a new paragraph.
- **Saving a document** –
- 1) Click save button or choose File → Save.
- 2) Choose folder in which to save document.
- 3) In the file name text box, enter a name for your file.
- 4) click save button to save the file.
- Closing a document –
- After finishing work, you should close your document and exit the program before you shut down.

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