Bangladesh Open University

Diploma in Computer Science and Application Program (DCSA)

**Digital System and Computer Organizations**

TMA – 1

Name the five basic units of a computer and describe the major functions of each.

Submitted by

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The five basic units of a computer are the central processing unit (CPU), memory, input devices, output devices, and storage devices. Each unit plays a crucial role in the functioning of a computer system. Let's delve into the major functions of each unit:

1. **Central Processing Unit (CPU):** The CPU is often referred to as the "brain" of the computer. It performs the bulk of the processing operations and executes instructions. The CPU consists of two key components:
   * Control Unit: It coordinates and controls the activities of other hardware components. It fetches instructions from memory, decodes them, and directs the execution of those instructions.
   * Arithmetic Logic Unit (ALU): The ALU performs mathematical calculations and logical operations, such as addition, subtraction, multiplication, division, comparisons, and logical AND/OR operations.

The CPU carries out the following major functions:

* + Instruction Execution: The CPU fetches instructions from memory, decodes them, and executes them in a sequence determined by the control unit.
  + Arithmetic and Logical Operations: The ALU performs mathematical calculations and logical comparisons as required by the instructions.
  + Control and Coordination: The control unit manages the flow of instructions and data within the CPU and between other components, ensuring proper synchronization and timing.

1. **Memory:** Memory, also known as primary storage or RAM (Random Access Memory), is responsible for temporarily storing data and instructions that the CPU requires for immediate processing. The major functions of memory include:
   * Program Execution: Memory holds the instructions and data necessary for the CPU to execute programs and perform tasks.
   * Data Storage: Data is stored in memory during processing. It allows for quick access and retrieval of information for processing or output.
   * Fast Read/Write Access: Memory provides fast read and write operations, enabling rapid data retrieval and updates.

There are different levels of memory in a computer, such as cache memory, primary memory (RAM), and virtual memory, each with varying speeds and capacities.

1. **Input Devices:** Input devices allow users to interact with the computer system and provide data and instructions for processing. Common input devices include keyboards, mice, touchscreens, scanners, microphones, and sensors. The major functions of input devices are:
   * Data Entry: Input devices enable users to input alphanumeric and symbolic data into the computer system.
   * Instruction Delivery: They allow users to provide instructions to the computer system, such as command inputs or configuration settings.
   * Control and Navigation: Input devices facilitate user control and navigation within software applications and operating systems.

Input devices convert physical input (e.g., keystrokes, mouse movements) into electronic signals that can be understood by the computer.

1. **Output Devices:** Output devices present processed data and information to users in a human-readable form. These devices display or convey the results of processing or the output of a computer system. Common output devices include monitors, printers, speakers, projectors, and tactile devices. The major functions of output devices include:
   * Data Presentation: Output devices display or present data, information, graphics, and multimedia content to users.
   * Result Communication: They convey the output of computations, reports, documents, and other processed information to users.
   * Feedback and Interaction: Output devices provide feedback to users based on their interactions with the computer system, facilitating user engagement.

Output devices convert electronic signals into human-perceivable formats, such as visual, auditory, or tactile outputs.

1. **Storage Devices:** Storage devices are responsible for storing data and information persistently, even when the computer system is powered off. They provide long-term data storage and retrieval. Common storage devices include hard disk drives (HDDs), solid-state drives (SSDs), optical drives, USB drives, and network-attached storage (NAS) devices. The major functions of storage devices include:
   * Long-Term Data Storage: Storage devices store large amounts of data and information, including operating systems, software applications, files, and user data.
   * Data Retrieval: They enable the retrieval of stored data for processing, modification, or transfer to other devices.
   * Data Backup and Archival: Storage devices facilitate data backup and archival, ensuring data security and disaster recovery.

Storage devices use various technologies, such as magnetic storage, flash memory, or optical media, to store and retrieve data.

These five basic units of a computer work together harmoniously to enable the functioning and operation of computer systems. The CPU performs processing operations, memory provides temporary storage, input devices capture user input, output devices present processed results, and storage devices store data persistently. The coordination and interaction among these units form the foundation of computing as we know it.