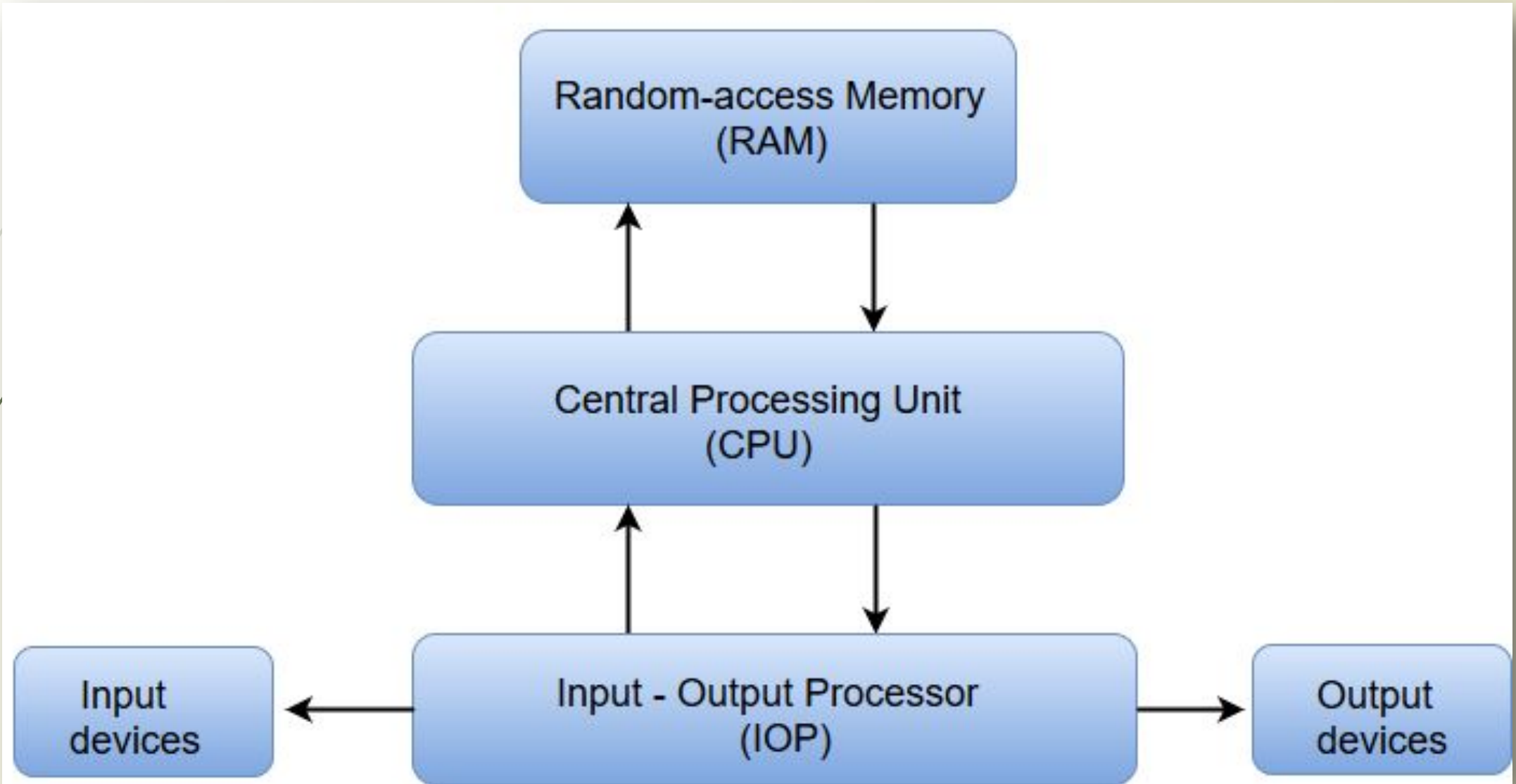






Introduction

SUJATA GHATAK, U.E.M, KOLKATA

BLOCK DIAGRAM OF DIGITAL COMPUTER



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- ❑ The Central Processing Unit (CPU) contains an arithmetic and logic unit for manipulating data, a number of registers for storing data, and a control circuit for fetching and executing instructions.
 - ❑ The memory unit of a digital computer contains storage for instructions and data.
 - ❑ The Random Access Memory (RAM) for real-time processing of the data.
 - ❑ The Input-Output devices for generating inputs from the user and displaying the final results to the user.
 - ❑ The Input-Output devices connected to the computer include the keyboard, mouse, terminals, magnetic disk drives, and other communication devices.



Computer organization

- Computer organization is concerned with the way the hardware components operate and the way they are connected together to form the computer system.
- The various components are assumed to be in place and the task is to investigate the organizational structure to verify that the computer parts operate as intended.



Compute design

- ❑ Compute design is concerned with the hardware design of the computer. Once the computer specifications are formulated, it is the task of the designer to develop hardware for the system.
- ❑ Computer design is concerned with the determination of what hardware should be used and how the parts should be connected.
- ❑ This aspect of computer hardware is sometimes referred to as computer implementation



Computer architecture

- ❑ Computer architecture is concerned with the structure and behavior of the computer as seen by the user.
- ❑ It includes the information formats, the instruction set, and techniques for addressing memory.
- ❑ The architectural design of a computer system is concerned with the specifications of the various functional modules, such as processors and memories, and structuring them together into a computer system



DATA REPRESENTATION

COMPLEMENT

- Complements are used in the digital computers in order to simplify the subtraction operation and for the logical manipulations. For each radix-r system (radix r represents base of number system) there are two types of complements.

S.N.	Complement	Description
1	Radix Complement	The radix complement is referred to as the r's complement
2	Diminished Radix Complement	The diminished radix complement is referred to as the (r-1)'s complement

$$\begin{aligned} r' \text{ s complement} &= (r^n)_{10} - N \\ (r-1)' \text{ s complement} &= \{(r^n)_{10} - 1\} - N \end{aligned}$$

