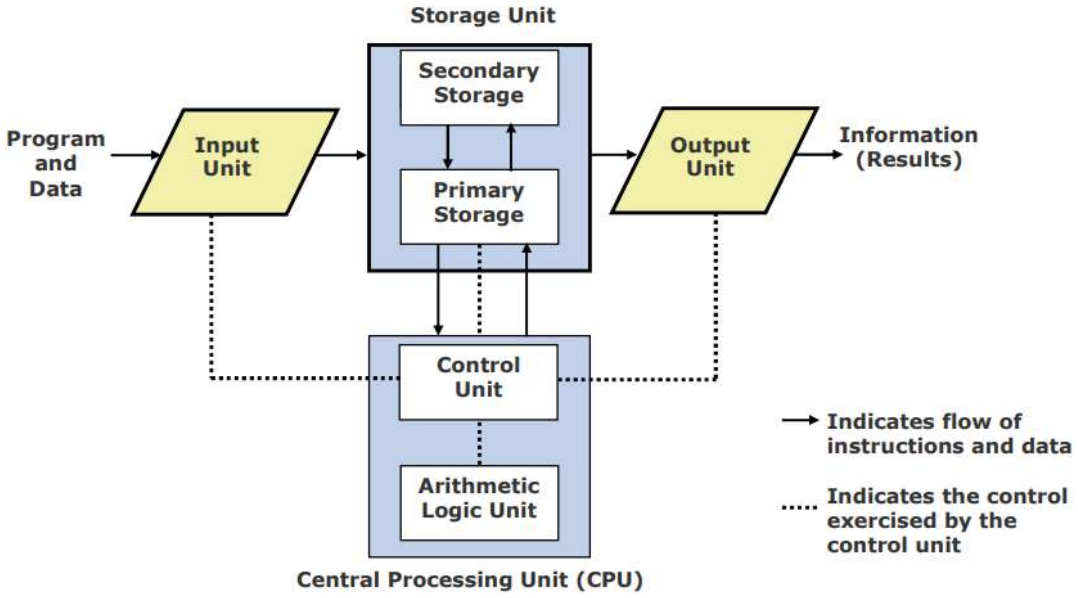
COMP101TH
Problem Solving Using Computer
Unit: 1 (Computer Fundamentals)
Lecture: 4
Basic Computer Organization

- **Difference between Computer Architecture and Computer Organization:**
  - Computer Architecture is a functional description of requirements and design implementation for the various parts of computer. It deals with functional behavior of computer system. It comes before the computer organization while designing a computer.
  - Computer Organization is how operational attribute are linked together and contribute to realize the architectural specification. Computer Organization deals with structural relationship.

"Architecture describes what the computer does.
Organization describes how it does it."

Computer Architecture	Computer Organization
Computer Architecture is concerned with the way hardware components are connected together to form a computer system.	Computer Organization is concerned with the structure and behaviour of a computer system as seen by the user.
It acts as the interface between hardware and software.	It deals with the components of a connection in a system.
Computer Architecture helps us to understand the functionalities of a system.	Computer Organization tells us how exactly all the units in the system are arranged and interconnected.
A programmer can view architecture in terms of instructions, addressing modes and registers.	Whereas Organization expresses the realization of architecture.
While designing a computer system architecture is considered first.	An organization is done on the basis of architecture.
Computer Architecture deals with high-level design issues.	Computer Organization deals with low-level design issues.
Architecture involves Logic (Instruction sets, Addressing modes, Data types, Cache optimization)	Organization involves Physical Components (Circuit design, Adders, Signals, Peripherals)

- **Basic Organization of a Computer System:**



- A computer consists of input unit that takes input, a CPU that processes the input and an output unit that produces output.
- All these devices communicate with each other through a common bus.
- A bus is a transmission path, made of a set of conducting wires over which data or information in the form of electric signals, is passed from one component to another in a computer.
- The bus can be of three types – Address bus, Data bus and Control Bus.
    - The address bus carries the address location of the data or instruction.
    - The data bus carries data from one component to another and the control bus carries the control signals.
    - The **system bus is the common communication path that carries signals to/from CPU, main memory and input/output devices.**
    - The input/output devices communicate with the system bus through the controller circuit which helps in managing various input/output devices attached to the computer.

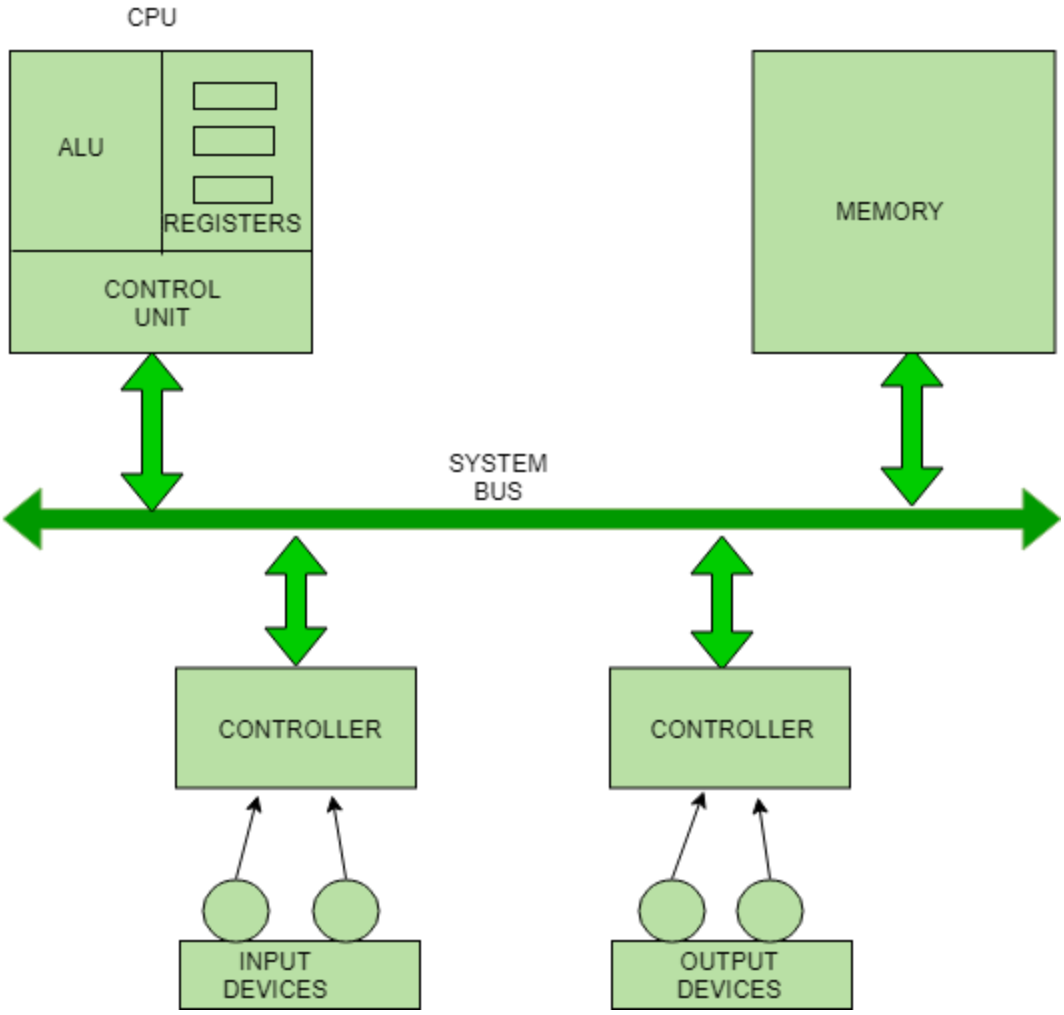


Fig: Connection of various functional components