Programming Fundamentals:
Introduction

Computer Literacy is the knowledge of computers, i.e., how a computer works and how to use a computer to get help for our daily life tasks.

Computer is an electronic device used for computing. It fetches the input from a user and applies some algorithms to process and produce a desired kind of output.

Input Devices are electronic components of the computer that are used to get data from users

Output Devices are electronic components that show the outcome to the user after the processing of a computer is finished.

System Unit is the primary processing unit comprised of some other components of a computer. For example, CPU, ROM, RAM and Motherboard.

Information Processing Cycle
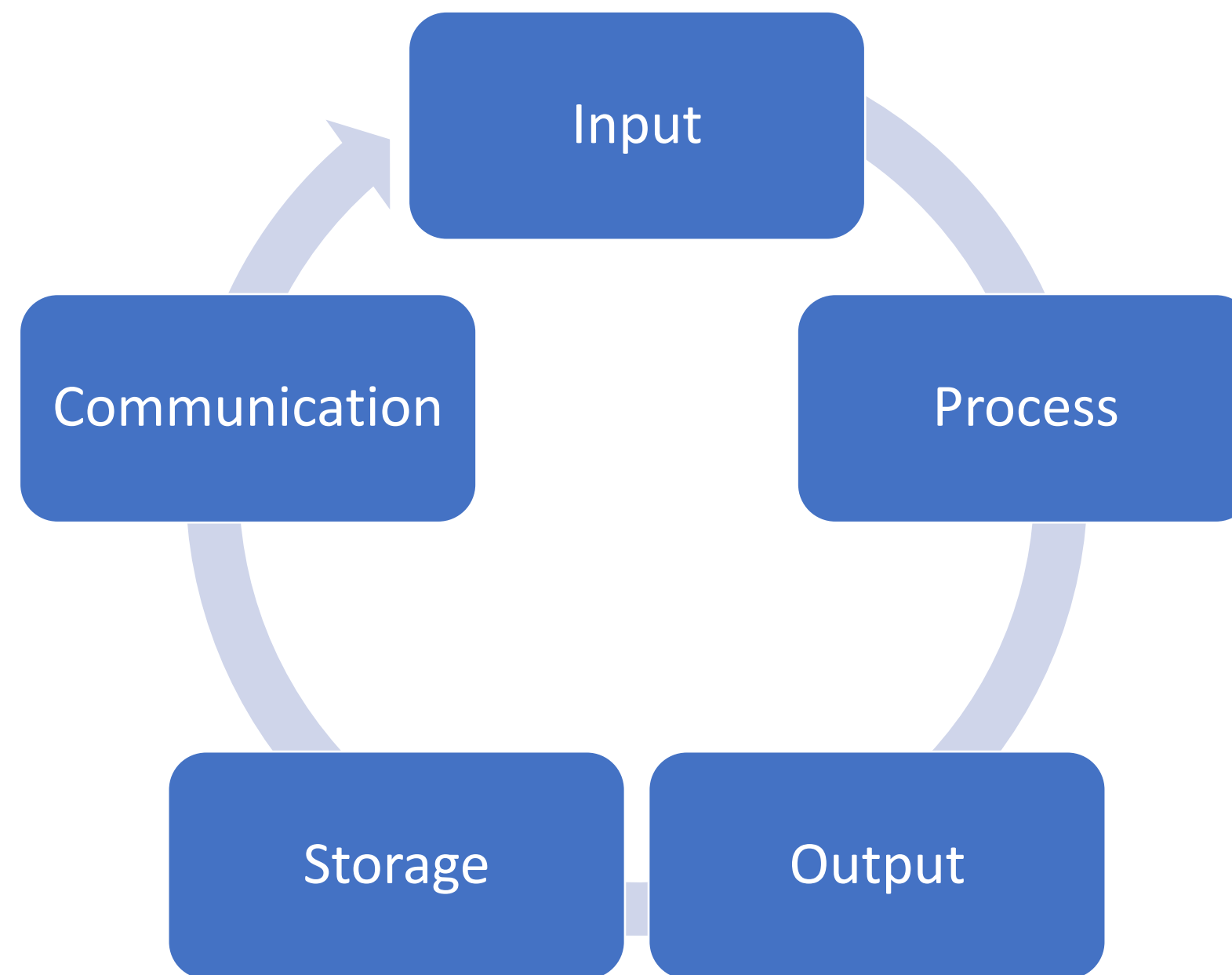
Central Processing Unit (CPU): A CPU or Processor is the main processing unit of a system that execute the instructions.

Random Access Memory (RAM): It temporarily stores all the executable instructions that are required to process an active task.

Motherboard: It is the main electronical board that holds all the component of a System unit and help in communication between different components of a computer.

Read-only memory (ROM): It stores the data permanently and is unable to modify it later in most cases.

Central Processing Unit (CPU): A CPU or Processor is the main processing unit of a system that execute the instructions.

Random Access Memory (RAM): It temporarily stores all the executable instructions that are required to process an active task.

Motherboard: It is the main electronical board that holds all the component of a System unit and help in communication between different components of a computer.

Read-only memory (ROM): It stores the data permanently and is unable to modify it later in most cases. It can be used to write instructions for a specific device, i.e., instructions to communicate with different components.

Storage Devices: These devices are used to store data permanently and access it for further computation. We can modify the data and remove it. For example, Hard Disk, memory card or USB.

Computer Network is a network which connects multiple computers. Whereas the **Internet** is a computer network that connects computers globally using WWW World Wide Web.

There are two kinds of network
- Server Client Network
- Peer-to-peer Network

Server Client Network: This is a type of computer network where multiple computers are interlinked with the help of a **Server** that controls and manage the communication; therefore, **client computers** access the **Server** to get information.

Peer-to-peer Network: In this kind of network, multiple computers are directly linked with each other and communicate without any central or server system.

After processing computer usually shows the processed data on a monitor, there are two main types of interfaces to show the processed data

- Graphical User Interface (GUI)
- Command Line Interface (CLI)

Graphical User Interface (GUI) helps users to interact with computers using Graphics whereas **Command Line Interface (CLI)** uses commands to interact with users.
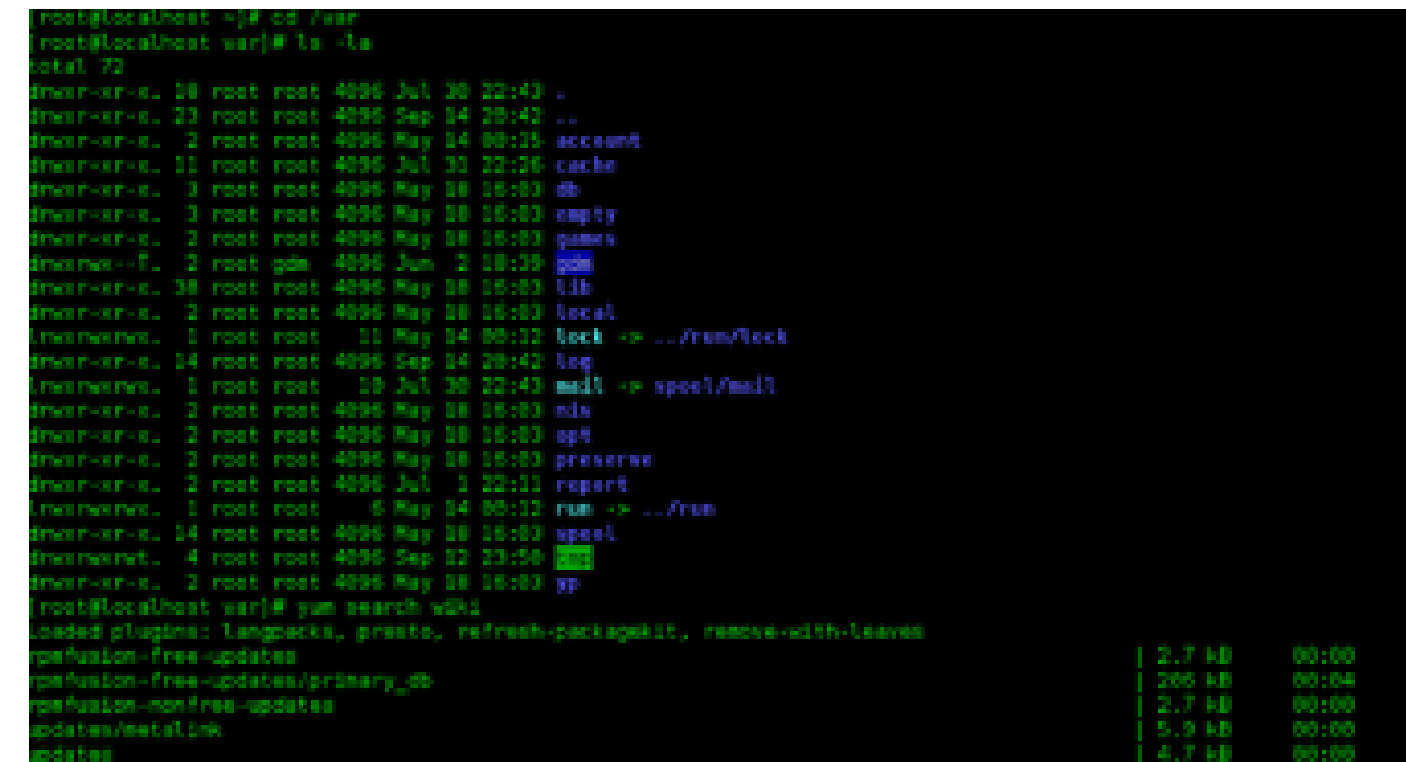
Computer software is a set of instructions that help users operate computers and extract the desired form of results. For example, Windows, Firefox and VLC player.

Software is of two kinds normally.

- System Software
- Application Software

System Software: It helps to run and communicate hardware and application software. For example, operating systems or utility Programs.

Operating systems manage hardware and help application software run smoothly. For example Windows, Linux and macOS. **Utility programs** help improve computer performance such as some drivers and antivirus programs.

Application Software: Designed to perform a specific and personalized task for example chrome and calculator.
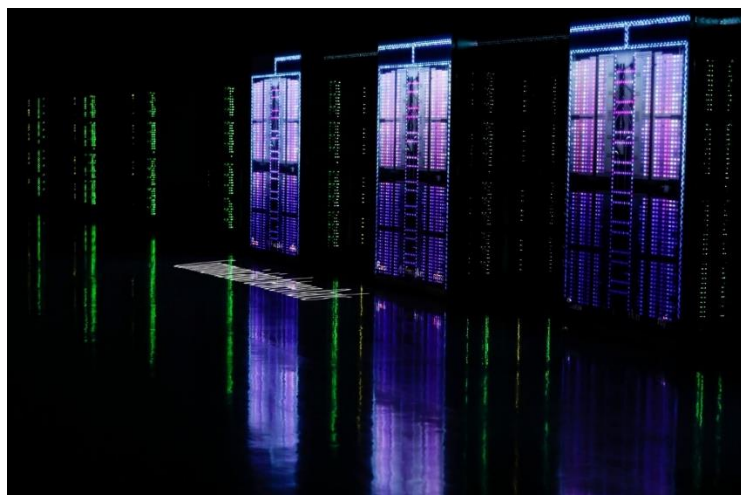
Programmer writes the instructions to develop software.

There are different kinds of computers according to the need and ease of users. Some of them are listed below

- Personal Computer (PC)
- Mobile Device or Smart Phone
- Laptop
- Embedded System
- Server Computer
- Super Computer
- IOT devices
- Quantum Computer

Personal Computer (PC): Highly customizable and easier to transport. A System unit consists of all essential parts and more devices can be attached to it.

Mobile Device or Smart Phone: Small and handheld computing devices that are very easy to carry.

Laptop: Replacement of the PC in a book-size device that can perform everything that a PC can do.

**Embedded System:** A computing device is attached to another device to achieve some specified tasks.

Server Computer: A special kind of system used to control the network of computing devices.

Super Computer: A room size expensive computer used for high and complex computational tasks.

IoT Devices: A network of devices to perform some real-life tasks.

Quantum Computer: A special kind of computer that operates according to the laws of quantum mechanics used to handle a very large dataset.
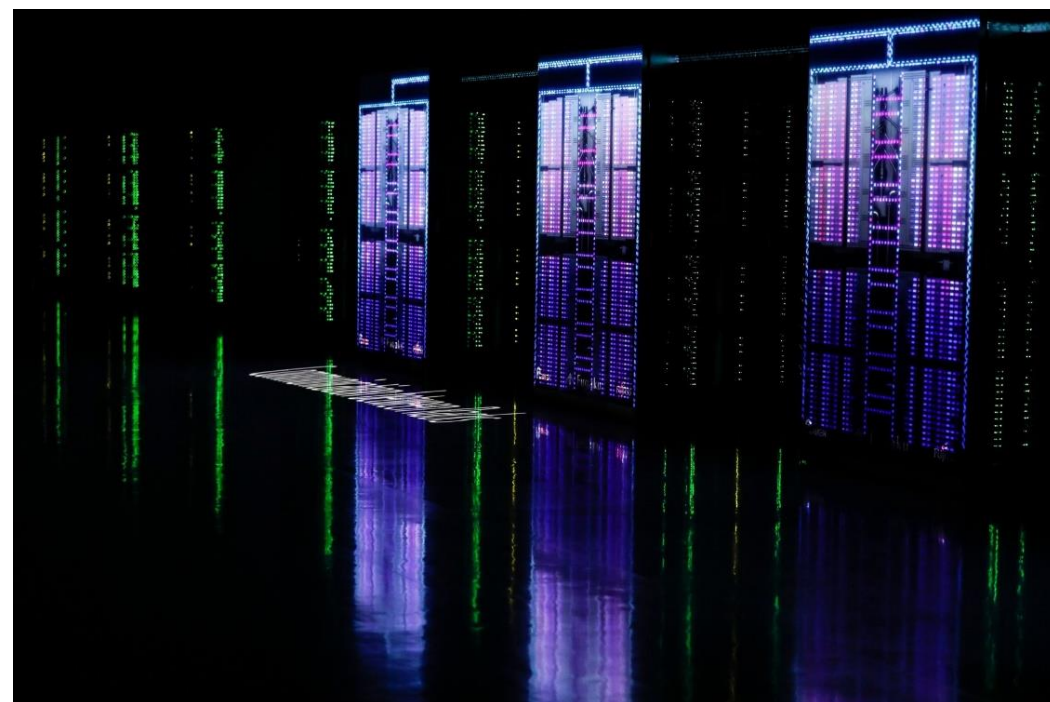
- Educational
- Financial
- Government
- Healthcare
- Science
- Publishing
- Travel
- Industrial