Programming with C and C++

CSC-101 (Lecture 02)

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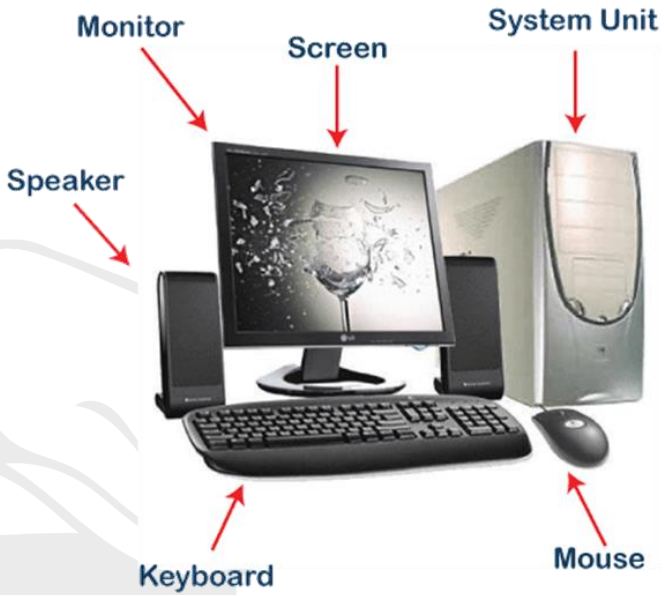
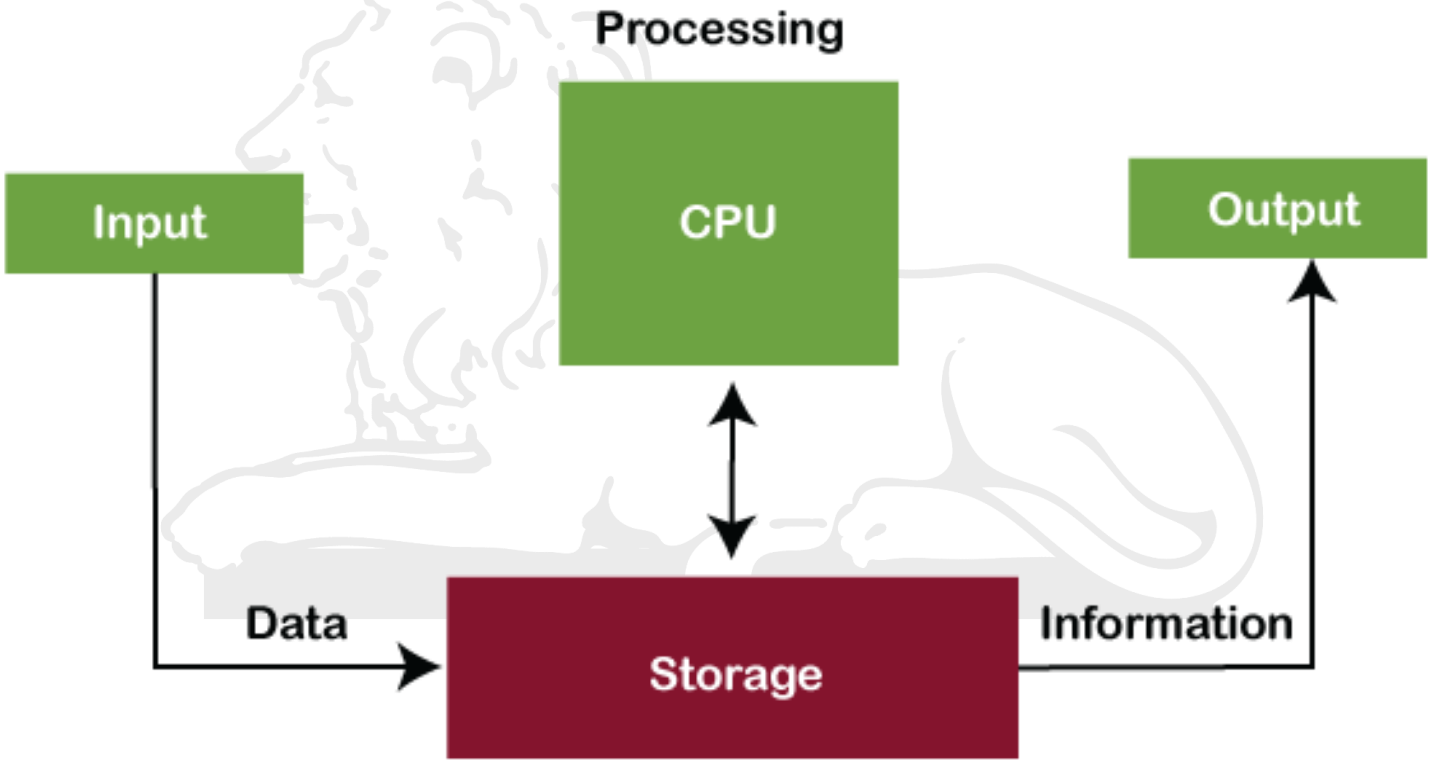
Introduction to Computer Systems

- A computer is a complex system consisting of both *hardware* and *software* components.
- The word *hardware* is used for physical devices such as TV sets, DVD players and computers. The word *software* is used for the information used with such devices: movies, music, novels, web pages, computer programs, and data.
- When talking about computer systems, hardware means the physical parts of the computer. Software means the programs and data used with the physical computer.



Introduction to Computer Systems

- A computer is a programmable electronic device that takes data, perform instructed arithmetic and logical operations, and gives the output.



Introduction to Computer Systems

- The major hardware components of a computer system are:
  - Processor
  - Main memory
  - Secondary memory
  - Input devices
  - Output devices

HP Pavilion x360 Convertible

Device name	DESKTOP-I
Processor	Intel(R) Core(TM) i5-7200U CPU @ 2.50GHz 2.71 GHz
Installed RAM	8.00 GB (7.88 GB usable)
Device ID	
Product ID	
System type	64-bit operating system, x64-based processor
Pen and touch	Touch support with 10 touch points

A brief History

- The term '**Computer**' (**Latin word 'computare'**) was first introduced in **1640** and referred to as 'one who calculates'.

- In **1833, Charles Babbage** (known as the father of the computer) - **Difference Engine.**

- **Later in 1837, Analytical Engine.**

Generations of Computer

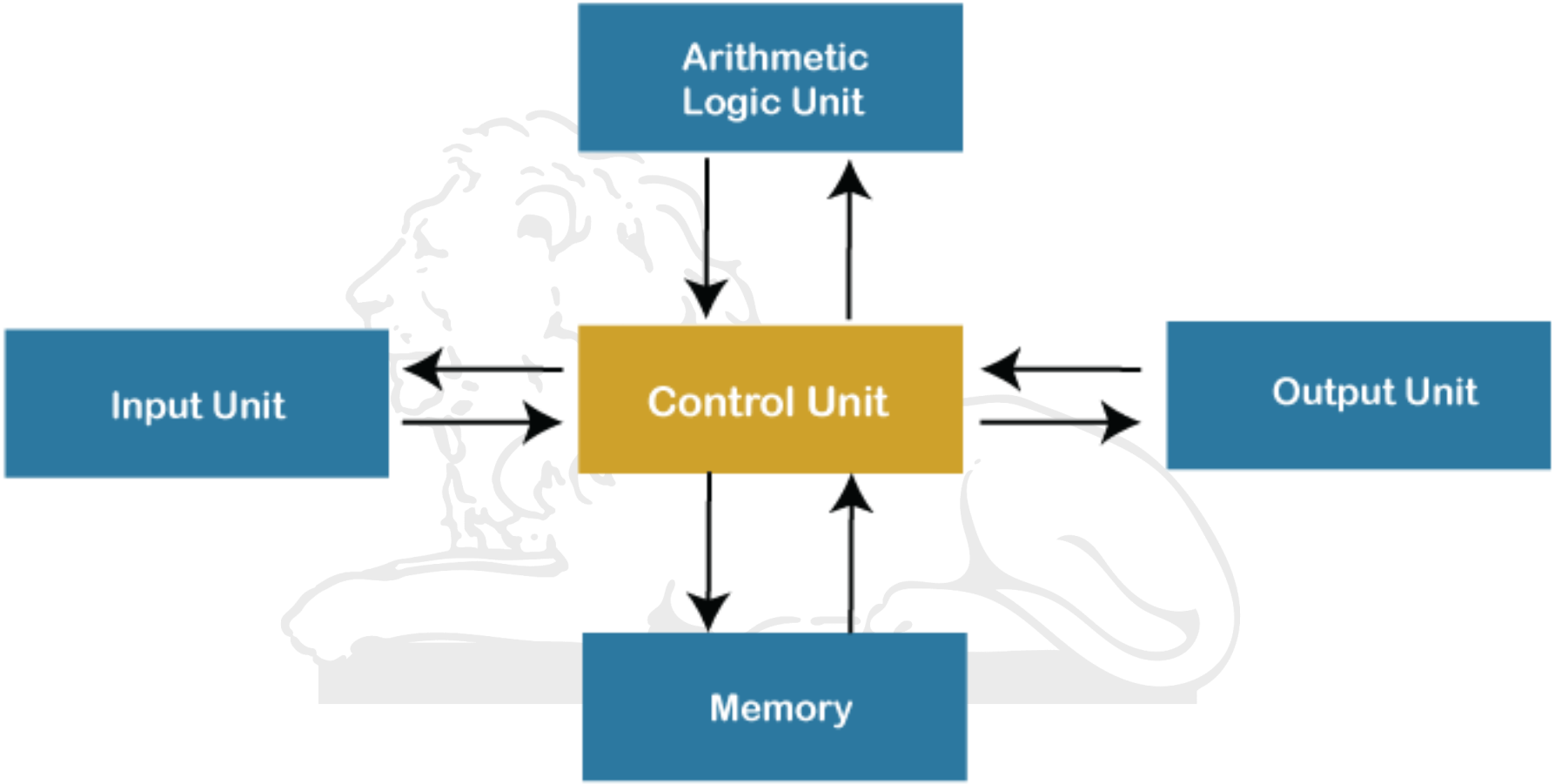
- **First Generation (1946 - 1959)** - Vacuum Tubes - ENIAC, EDVAC, UNIVAC, etc.
- **Second Generation (1959 - 1965)**: Transistors - IBM 1400, IBM 1620, IBM 7000 series, etc.
- **Third Generation (1965 - 1971)**: Integrated Circuits (ICs) - IBM 360, IBM 370, PDP, etc.
- **Fourth Generation (1971 - 1980):** Very large scale integrated (VLSI) circuits. STAR 1000, CRAY-1, CRAY-X-MP, DEC 10, etc.
- **Fifth Generation (1980 - Present)**: The fifth generation is still ongoing. Ultra large scale integration (ULSI), artificial intelligence (AI), and parallel processing hardware. The fifth generation of computers includes Desktop, Laptop, NoteBook, etc.

Software

- **System Software**: System software helps establish communication between hardware components so that the user can interact with the computer.
  - Windows, Mac OS, Chrome OS, Ubuntu, Android. iOS. Blackberry. PlayStation System Software.

- **Application Software**: Application software is designed to help users to perform specific tasks, such as online surfing, setting the alarm, listening to music, playing videos, photo designing, editing, etc.

Basic Parts of Computer



Lecture Outline

In this lecture, we will go through the following topics:

- Introduction to Programming Languages
- Algorithms
- Pseudo code
- Flowcharts

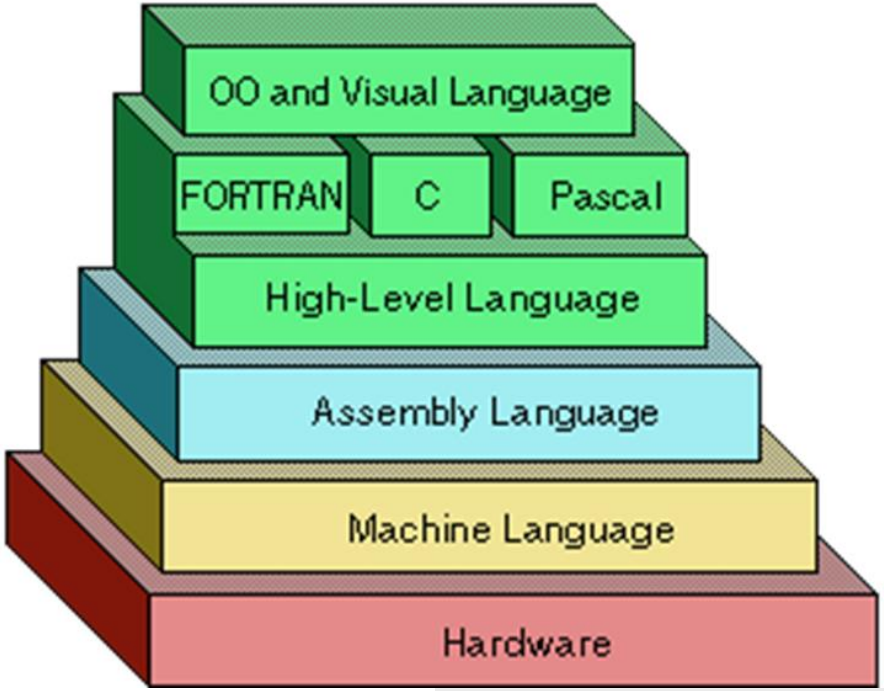
- Algorithm:
  - A set of **explicit, unambiguous finite steps**, which when carried out for a given set of **initial condition** to produce the corresponding **output** and terminate in **finite time**.
- Program:
  - An implementation of an algorithm in some programming languages
- Data Structure:
  - **Organization** of data needed to solve the problem

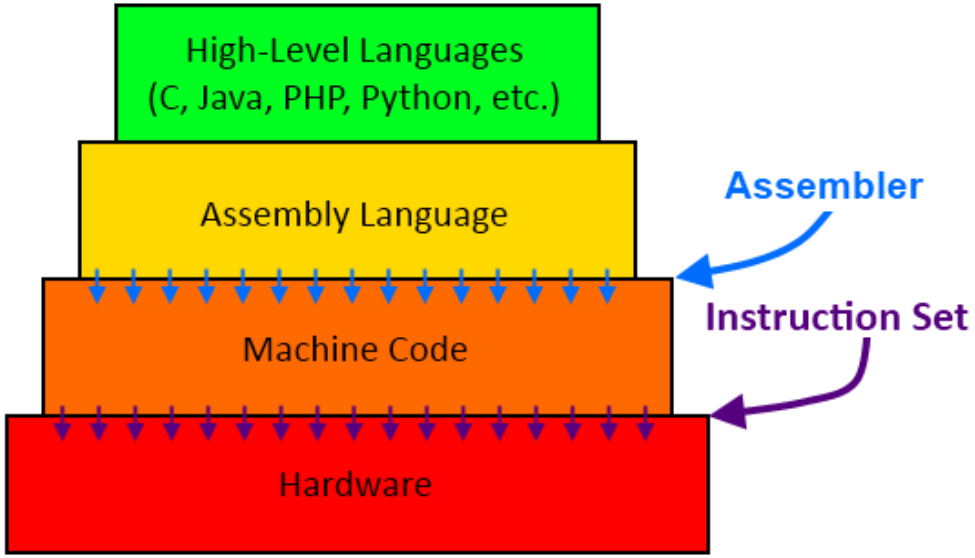
Programming Languages

- **Programming Language** is an agreed upon format of symbols that allow a programmer to instruct a computer to perform certain predefined tasks.

- Provide features to support the data processing activities, which include declaring variables, evaluating numeric expressions, assigning values to variables, reading and writing data to devices, looping and making decisions.

Low-level/High-level languages





Thank You!