



# **SNS COLLEGE OF ENGINEERING**

Kurumbapalayam (Po), Coimbatore – 641 107

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Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A' Grade  
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

## **DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**COURSE NAME : 20CS101 PROGRAMMING FOR PROBLEM SOLVING**

**I YEAR /I SEMESTER**

**Unit 1- INTRODUCTION TO PROBLEM SOLVING TECHNIQUES**

**Topic 1: Fundamentals - Computer Hardware**





# Brain Storming



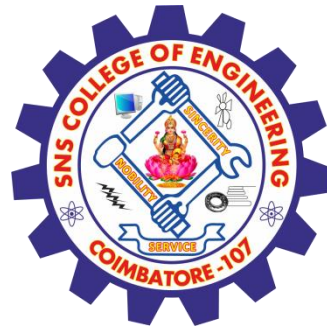
1. What is Software?
2. How to develop software?



# What is Computer?



- Its an electronic Device that is used for information Processing.
- Computer.. Latin word.. Compute.
- Calculation Machine.
- A computer system includes a computer, peripheral devices, and software.



# Introduction to Computer



- Accepts input, processes data, stores data, and produces output
- **Input** refers to whatever is sent to a Computer system
- **Data** refers to the symbols that represent facts, objects, and ideas
- **Processing** is the way that a computer manipulates data
- A computer processes data in a device called the **central processing unit**  
(CPU)

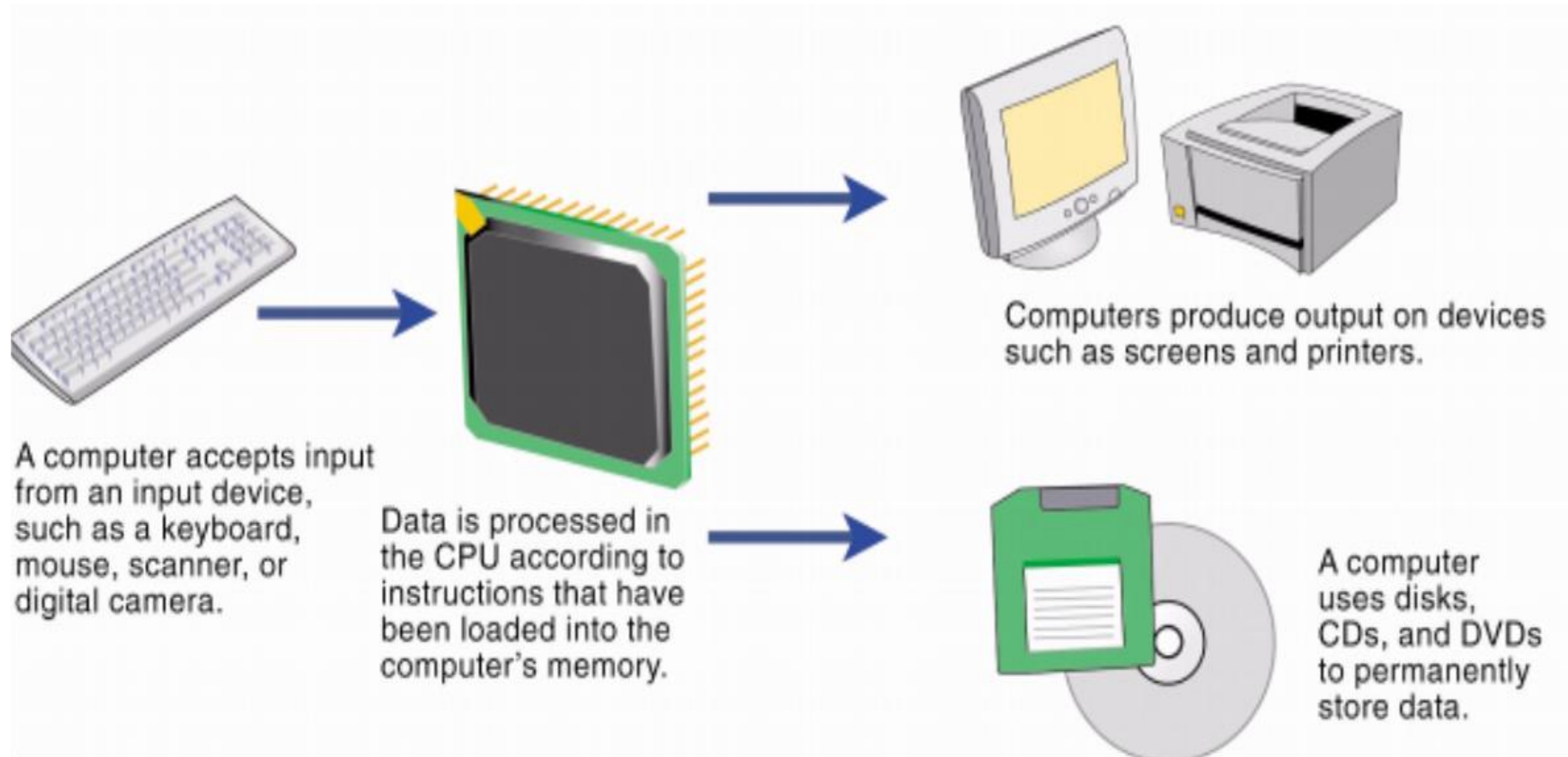


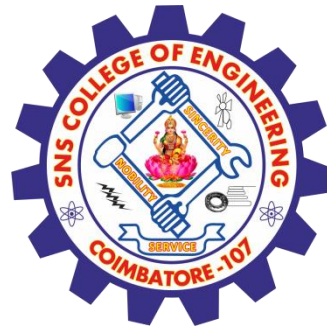
## Conti...



- **Memory** is an area of a computer that holds data that is waiting to be processed, stored, or output
- **Storage** is the area where data can be left on a permanent basis
- Computer **output** is the result produced by the computer
- An output device displays, prints or transmits the results of processing







Conti...



## Computer

- Performs computations and makes logical decisions
- Millions / billions times faster than human beings

## Computer programs

- Sets of instructions for which computer processes data

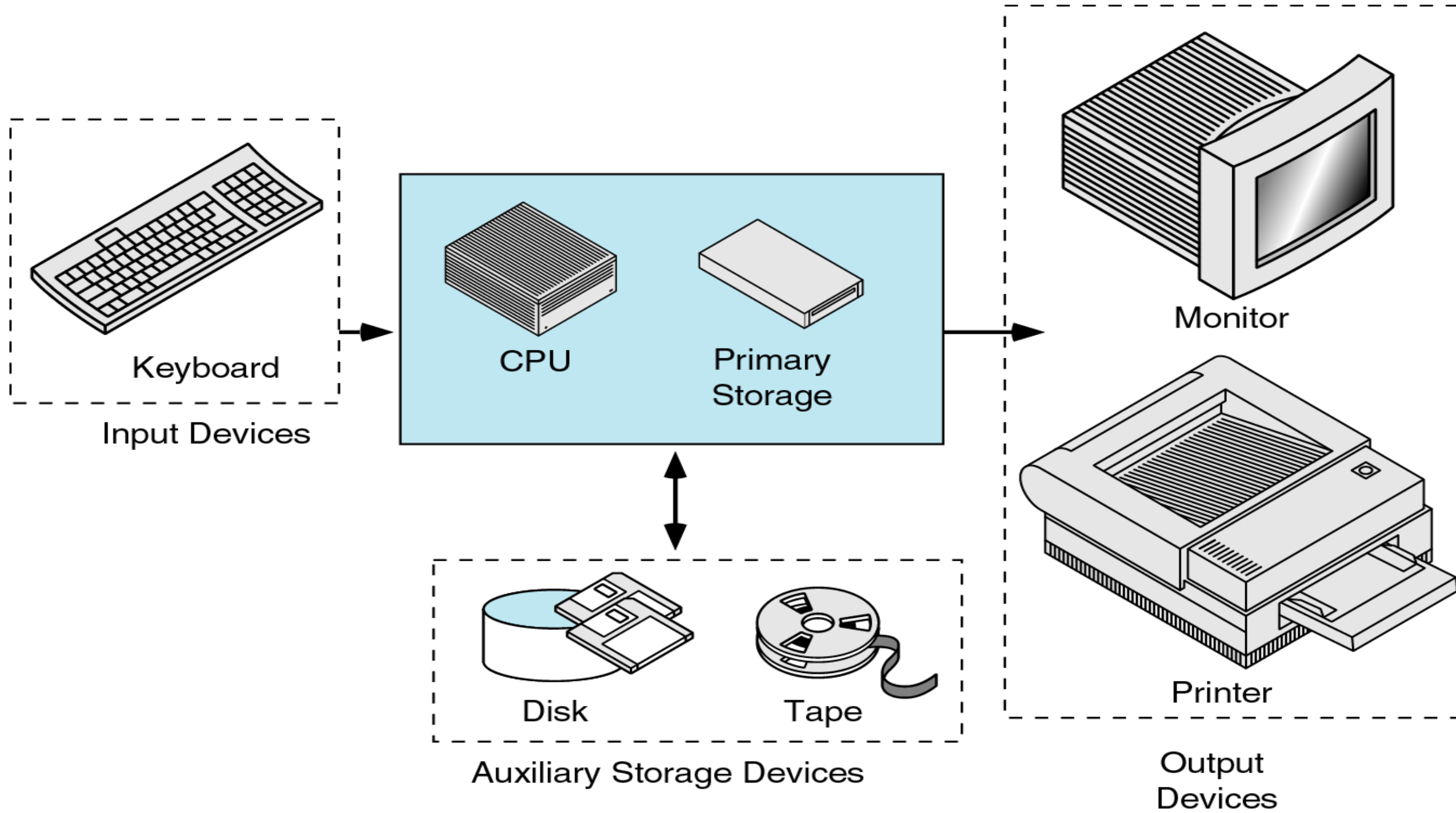
## Hardware

- Physical devices of computer system

## Software

- Programs that run on computers

# Conti.....



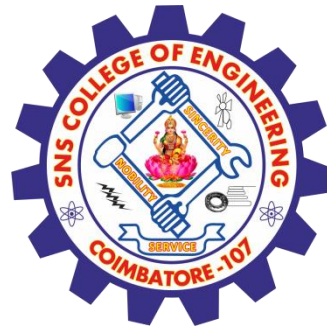




# Characteristics of Computers



- High Processing Speed
- Accuracy
- Reliability
- Versatility
- Diligence



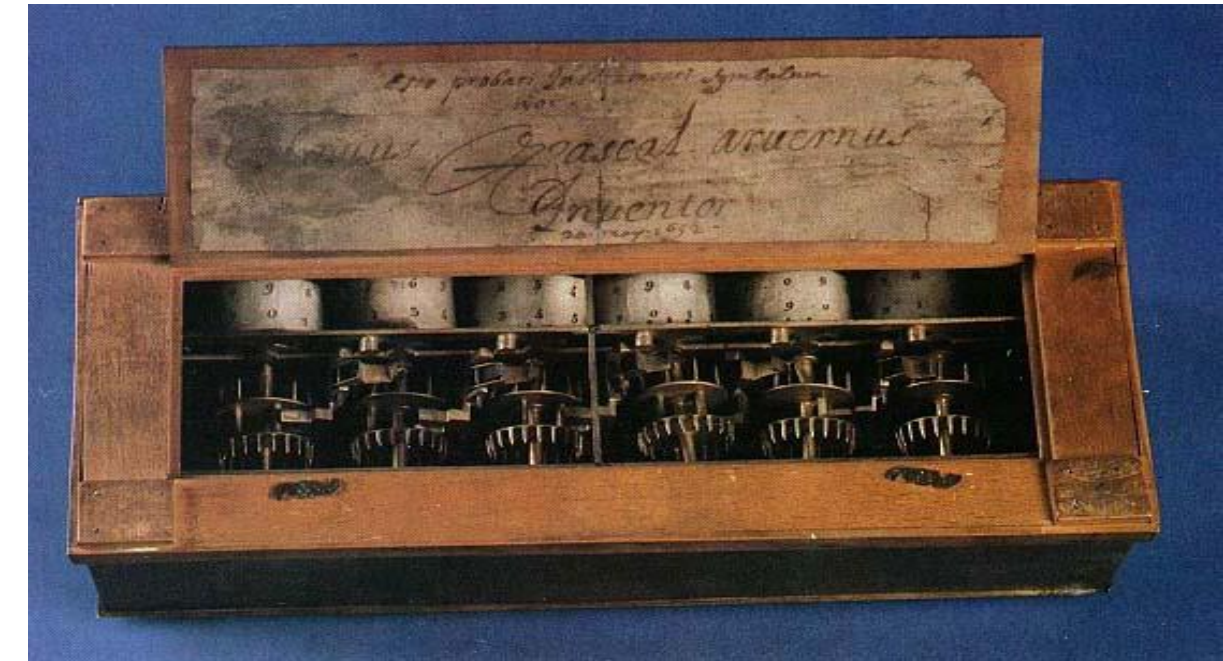
# History of Computers

- Before the 1500s, in Europe, calculations were made with an **abacus**

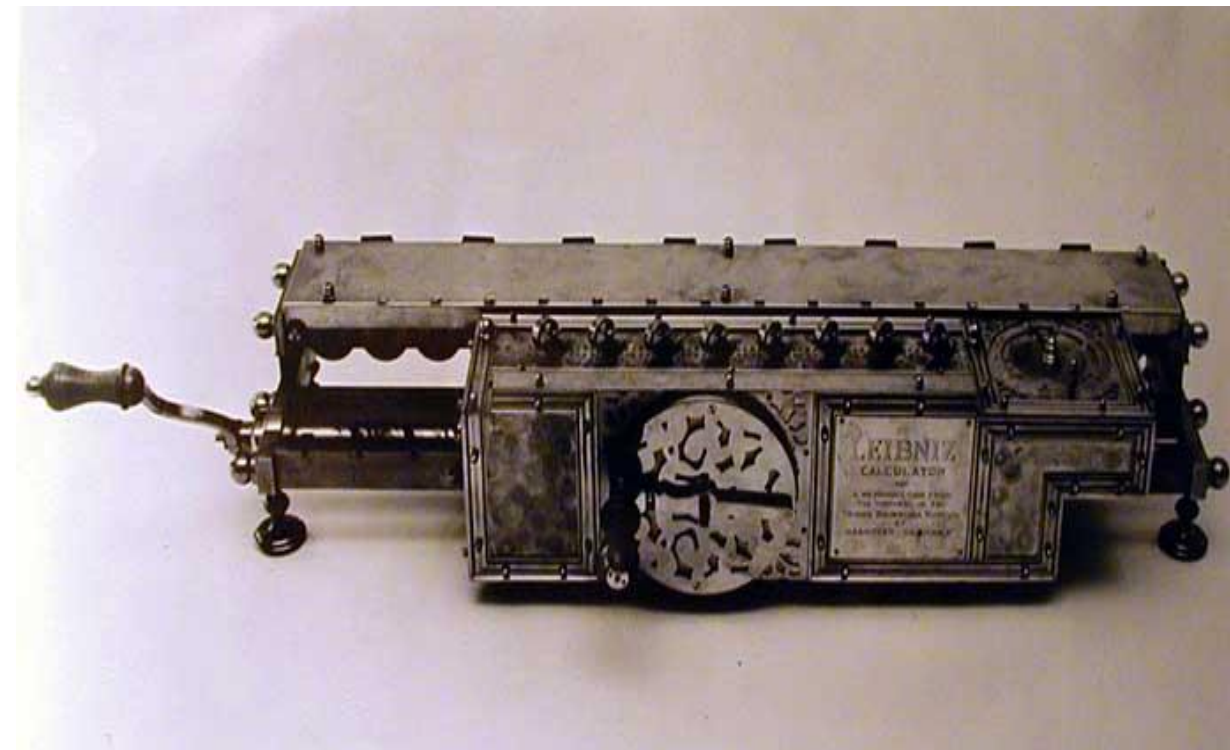


Invented around 500BC, available in many cultures (China, Mesopotamia, Japan, Greece, Rome, etc.)

- In 1642, **Blaise Pascal** (French mathematician, physicist, philosopher) invented a mechanical calculator called the **Pascaline**



- In 1671, **Gottfried von Leibniz** (German mathematician, philosopher) extended the Pascaline to do multiplications, divisions, square roots: the **Stepped Reckoner**



None of these machines had memory, and they required human intervention at each step



# Generations of Computer

- Generation in computer terminology is a change in technology a computer is/was being used.
- Initially, the generation term was used to distinguish between varying hardware technologies.
- Nowadays, generation includes both hardware and software, which together make up an entire computer system.





## Conti...



Sr. No.	Generation & Description
1	<b><u>First Generation</u></b> The period of first generation: 1946-1959. Vacuum tube based.
2	<b><u>Second Generation</u></b> The period of second generation: 1959-1965. Transistor based.
3	<b><u>Third Generation</u></b> The period of third generation: 1965-1971. Integrated Circuit based.
4	<b><u>Fourth Generation</u></b> The period of fourth generation: 1971-1980. VLSI microprocessor based.
5	<b><u>Fifth Generation</u></b> The period of fifth generation: 1980-onwards. ULSI microprocessor based.



# First Generation Computers



- The period of first generation was from 1946-1959. The computers of first generation used vacuum tubes as the basic components for memory and circuitry for CPU (Central Processing Unit).
- These tubes, like electric bulbs, produced a lot of heat and the installations used to fuse frequently. Therefore, they were very expensive and only large organizations were able to afford it.





# Types of Practice



- In this generation, mainly batch processing operating system was used.
- Punch cards, paper tape, and magnetic tape was used as input and output devices.
- The computers in this generation used machine code as the programming language.



Conti...







## Conti...



The main features of the first generation are:

- Vacuum tube technology
- Unreliable
- Supported machine language only
- Very costly
- Generated a lot of heat
- Slow input and output devices
- Huge size
- Need of AC
- Non-portable
- Consumed a lot of electricity





**Conti.....**



Some computers of this generation were:

- ENIAC
- EDVAC
- UNIVAC
- IBM-701
- IBM-650



# Second Generation Computers



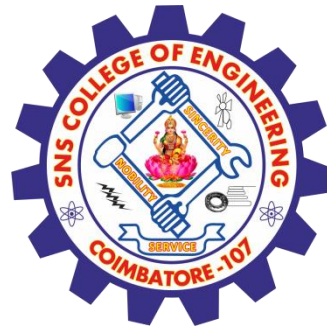
- The period of second generation was from 1959-1965.
- In this generation, transistors were used that were cheaper, consumed less power, more compact in size, more reliable and faster than the first generation machines made of vacuum tubes.
- In this generation, magnetic cores were used as the primary memory and magnetic tape and magnetic disks as secondary storage devices.
- In this generation, assembly language and high-level programming languages like FORTRAN, COBOL were used.
- The computers used batch processing and multiprogramming operating system.



# Conti.....



**TRANSISTOR COMPUTER**



## Conti...



The main features of second generation are:

- Use of transistors
- Reliable in comparison to first generation computers
- Smaller size as compared to first generation computers
- Generated less heat as compared to first generation computers
- Consumed less electricity as compared to first generation computers
- Faster than first generation computers
- Still very costly
- AC required
- Supported machine and assembly languages



## Conti.....



Some computers of this generation were:

- IBM 1620
- IBM 7094
- CDC 1604
- CDC 3600
- UNIVAC 1108



# Third Generation Computers



- The period of third generation was from 1965-1971.
- The computers of third generation used Integrated Circuits (ICs) in place of transistors.
- A single IC has many transistors, resistors, and capacitors along with the associated circuitry.



## Conti.....



- The IC was invented by Jack Kilby. This development made computers smaller in size, reliable, and efficient.
- In this generation remote processing, time-sharing, multi-programming operating system were used.
- High-level languages (FORTRAN-II TO IV, COBOL, PASCAL PL/1, BASIC, ALGOL-68 etc.) were used during this generation.





## Conti...



The main features of third generation are:

- IC used
- More reliable in comparison to previous two generations
- Smaller size
- Generated less heat
- Faster
- Lesser maintenance
- Costly
- AC required
- Consumed lesser electricity
- Supported high-level language



IC





## Conti.....



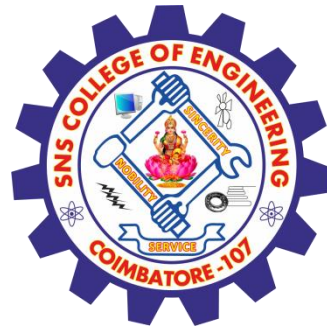
Some computers of this generation were:

- IBM-360 series
- Honeywell-6000 series
- PDP (Personal Data Processor)
- IBM-370/168
- TDC-316

# Fourth Generation Computers



- The period of fourth generation was from 1971-1980.
- Computers of fourth generation used Very Large Scale Integrated (VLSI) circuits.
- VLSI circuits having about 5000 transistors and other circuit elements with their associated circuits on a single chip made it possible to have microcomputers of fourth generation.
- Fourth generation computers became more powerful, compact, reliable, and affordable.
- As a result, it gave rise to Personal Computer (PC) revolution.
- In this generation, time sharing, real time networks, distributed operating system were used. All the high-level languages like C, C++, DBASE etc., were used in this generation.



## Conti.....



The main features of fourth generation are:

- VLSI technology used
- Very cheap
- Portable and reliable
- Use of PCs
- Very small size
- Pipeline processing
- No AC required
- Concept of internet was introduced
- Great developments in the fields of networks
- Computers became easily available



Example: VLSI







## Conti...



Some computers of this generation were:

- DEC 10
- STAR 1000
- PDP 11
- CRAY-1(Super Computer)
- CRAY-X-MP(Super Computer)



# Fifth Generation Computers



- The period of fifth generation is 1980-till date. In the fifth generation, VLSI technology became ULSI (Ultra Large Scale Integration) technology, resulting in the production of microprocessor chips having ten million electronic components.
- This generation is based on parallel processing hardware and AI (Artificial Intelligence) software. AI is an emerging branch in computer science, which interprets the means and method of making computers think like human beings. All the high-level languages like C and C++, Java, .Net etc., are used in this generation.



Conti...



AI includes:

- Robotics
- Neural Networks
- Game Playing
- Development of expert systems to make decisions in real-life situations
- Natural language understanding and generation





The main features of fifth generation are:

- ULSI technology
- Development of true artificial intelligence
- Development of Natural language processing
- Advancement in Parallel Processing
- Advancement in Superconductor technology
- More user-friendly interfaces with multimedia features
- Availability of very powerful and compact computers at cheaper rates



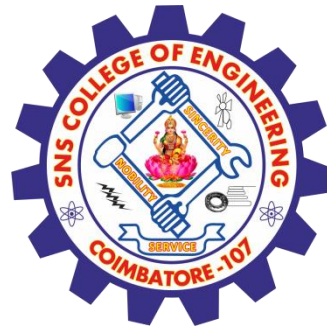


## Conti...



Some computer types of this generation are:

- Desktop
- Laptop
- NoteBook
- UltraBook
- ChromeBook



# Types of Computer



Sr. No.	Type	Specifications
1	PC (Personal Computer)	It is a single user computer system having moderately powerful microprocessor
2	Workstation	It is also a single user computer system, similar to personal computer however has a more powerful microprocessor
3	Mini Computer	It is a multi-user computer system, capable of supporting hundreds of users simultaneously.
4	Main Frame	It is a multi-user computer system, capable of supporting hundreds of users simultaneously. Software technology is different from minicomputer.
5	Supercomputer	It is an extremely fast computer, which can execute hundreds of millions of instructions per second.



# Basic Computer Hardware



The basic parts without which a computer cannot work are as follows:

**Processor:** It executes instructions from software and hardware.

**Memory:** It is the primary memory for data transfer between the CPU and storage.

**Motherboard:** It is the part that connects all other parts or components of a computer.

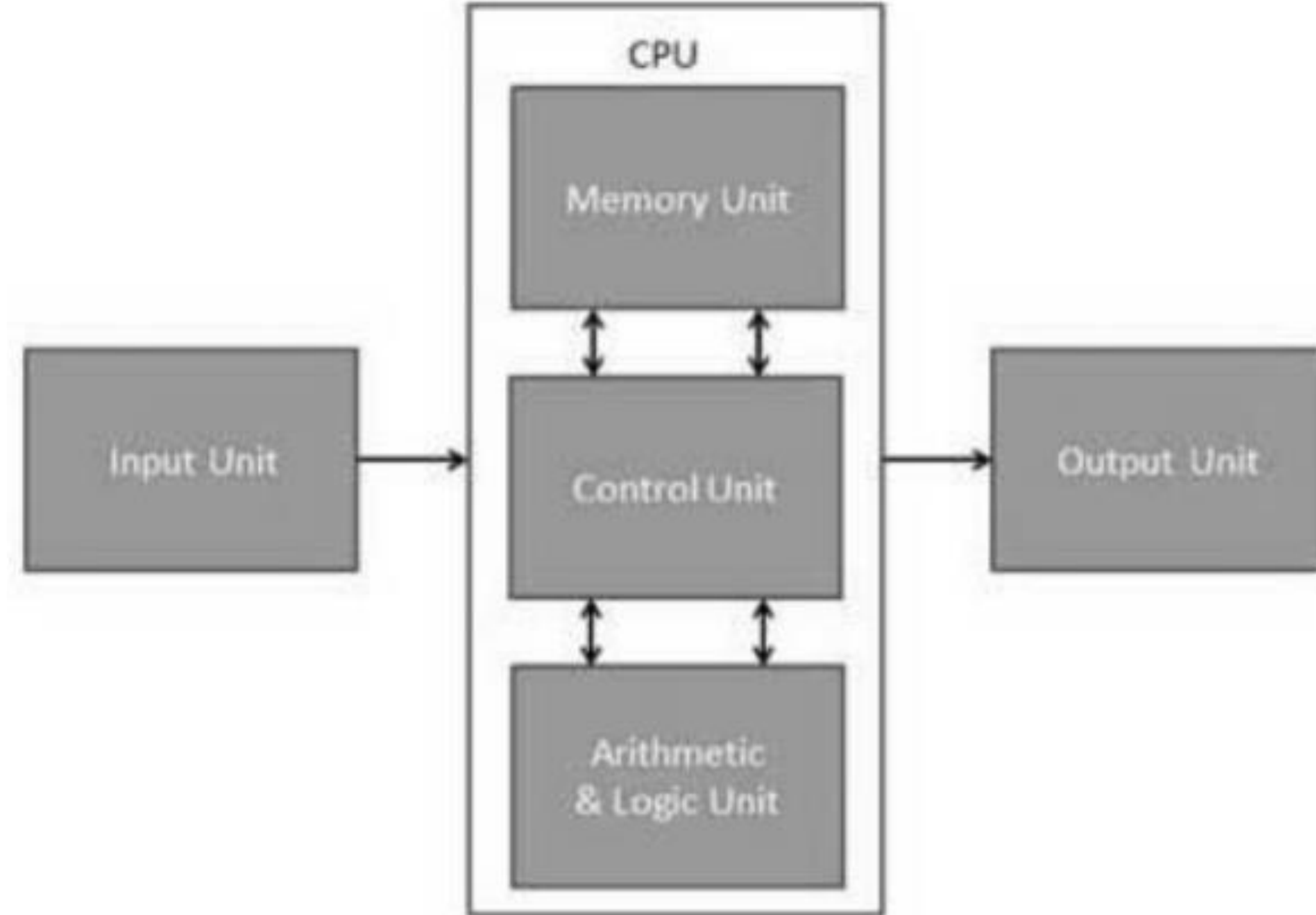
**Storage Device:** It permanently stores the data, e.g., hard drive.

**Input Device:** It allows you to communicate with the computer or to input data, e.g., a keyboard.

**Output Device:** It enables you to see the output, e.g., monitor.



# Conti.....







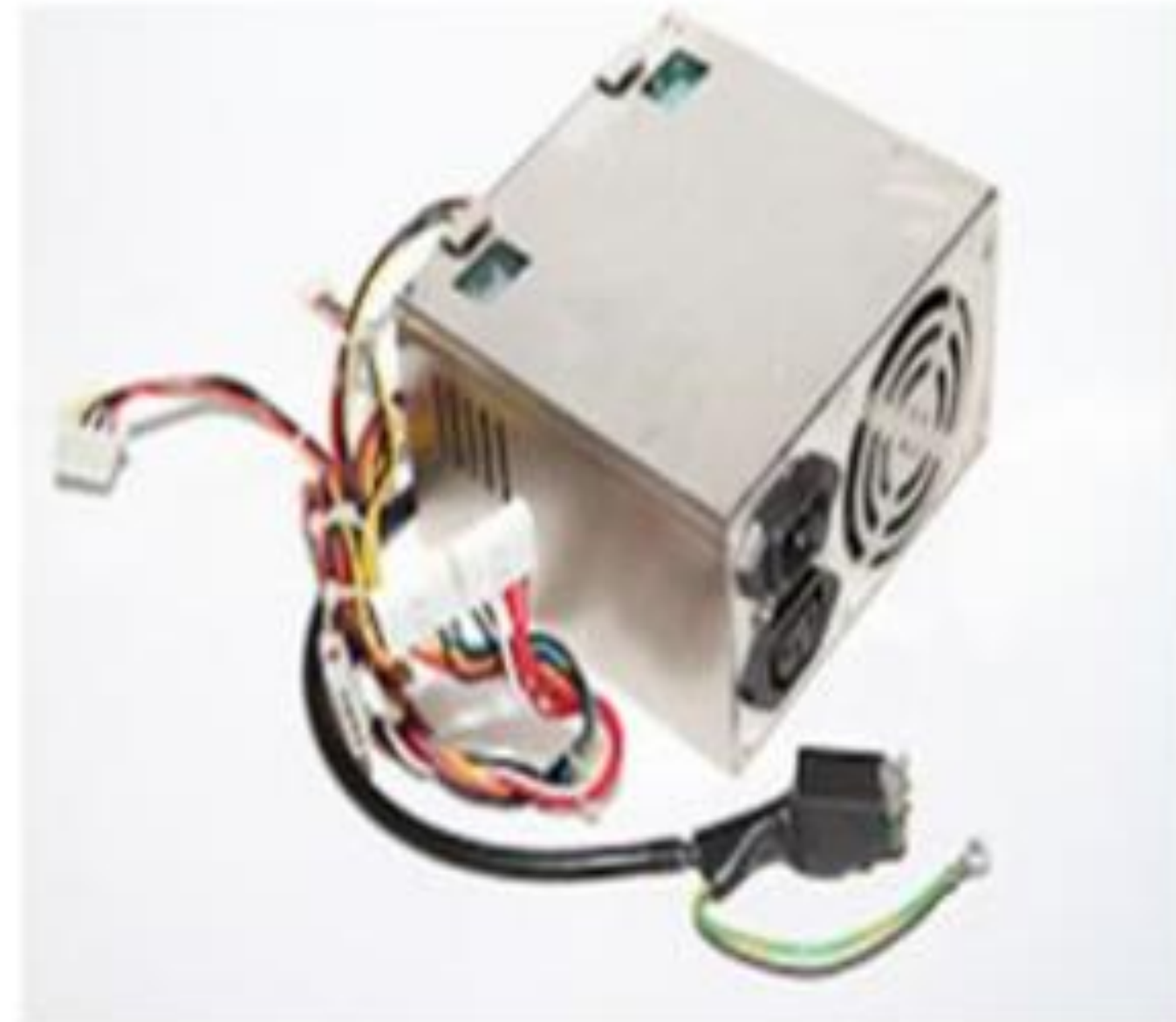
## Conti...



Sr. No.	Operation	Description
1	Take Input	The process of entering data and instructions into the computer system.
2	Store Data	Saving data and instructions so that they are available for processing as and when required.
3	Processing Data	Performing arithmetic, and logical operations on data in order to convert them into useful information.
4	Output Information	The process of producing useful information or results for the user, such as a printed report or visual display.
5	Control the workflow	Directs the manner and sequence in which all of the above operations are performed.



1. Inside of a desktop casing

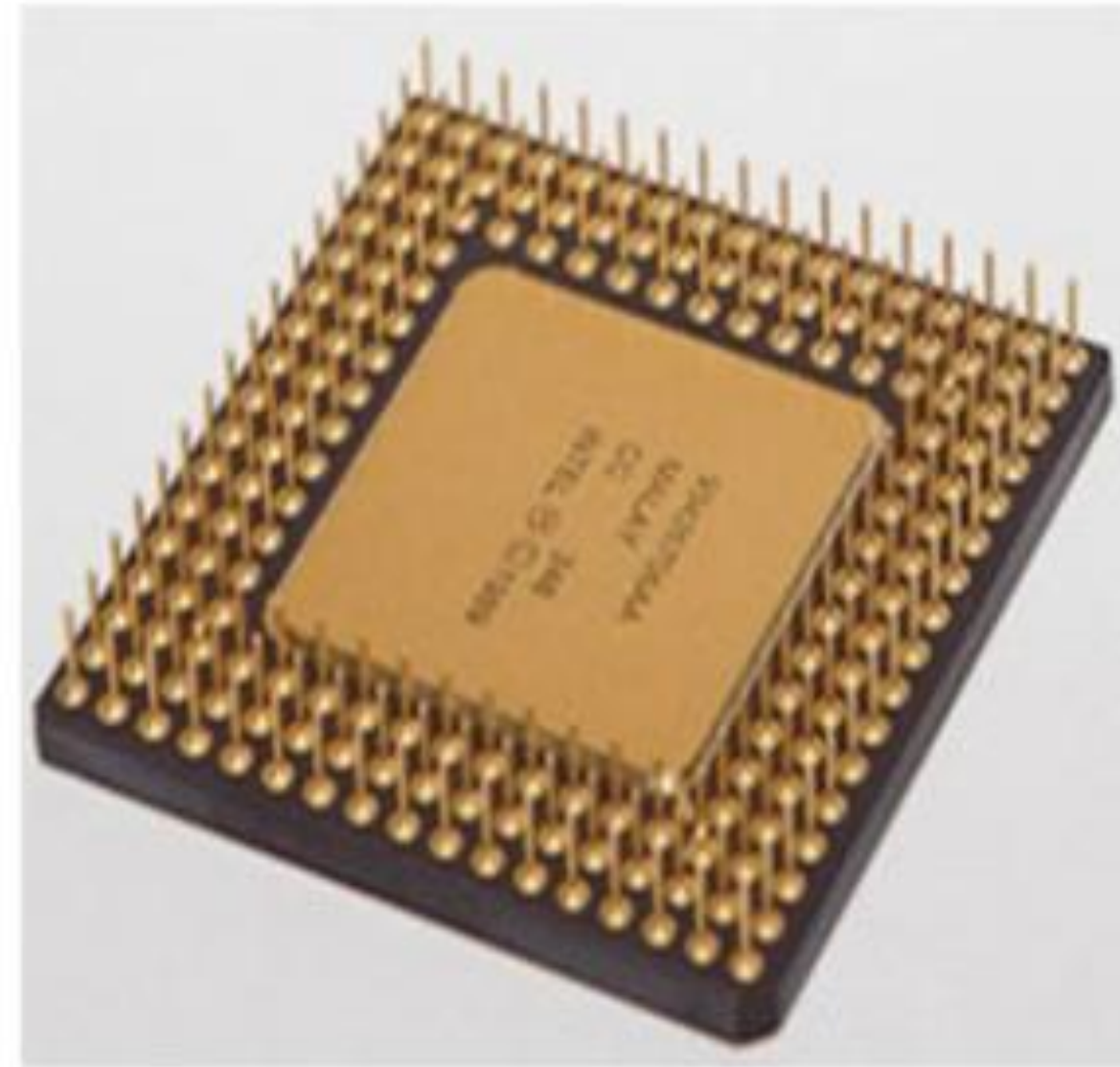


2. Powe supply box





3. Motherboard



4. CPU (Intel pentium)



5. Memory modules



6. PCI card





7. CD/DVD drive



8. Floppy disk drive



9. Hard drive



10. Cables





11. Heat sink with fan



12. Connnectors

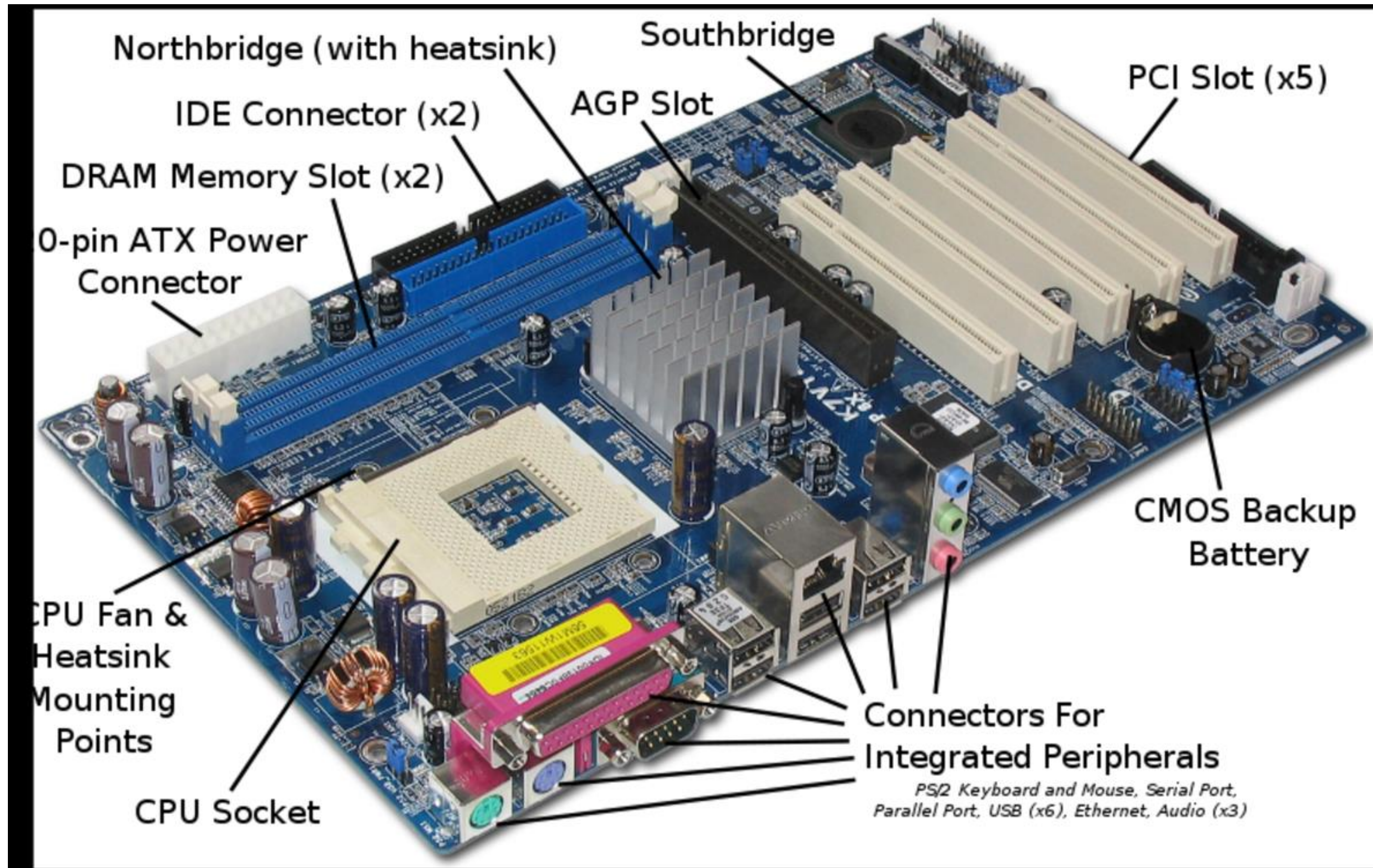




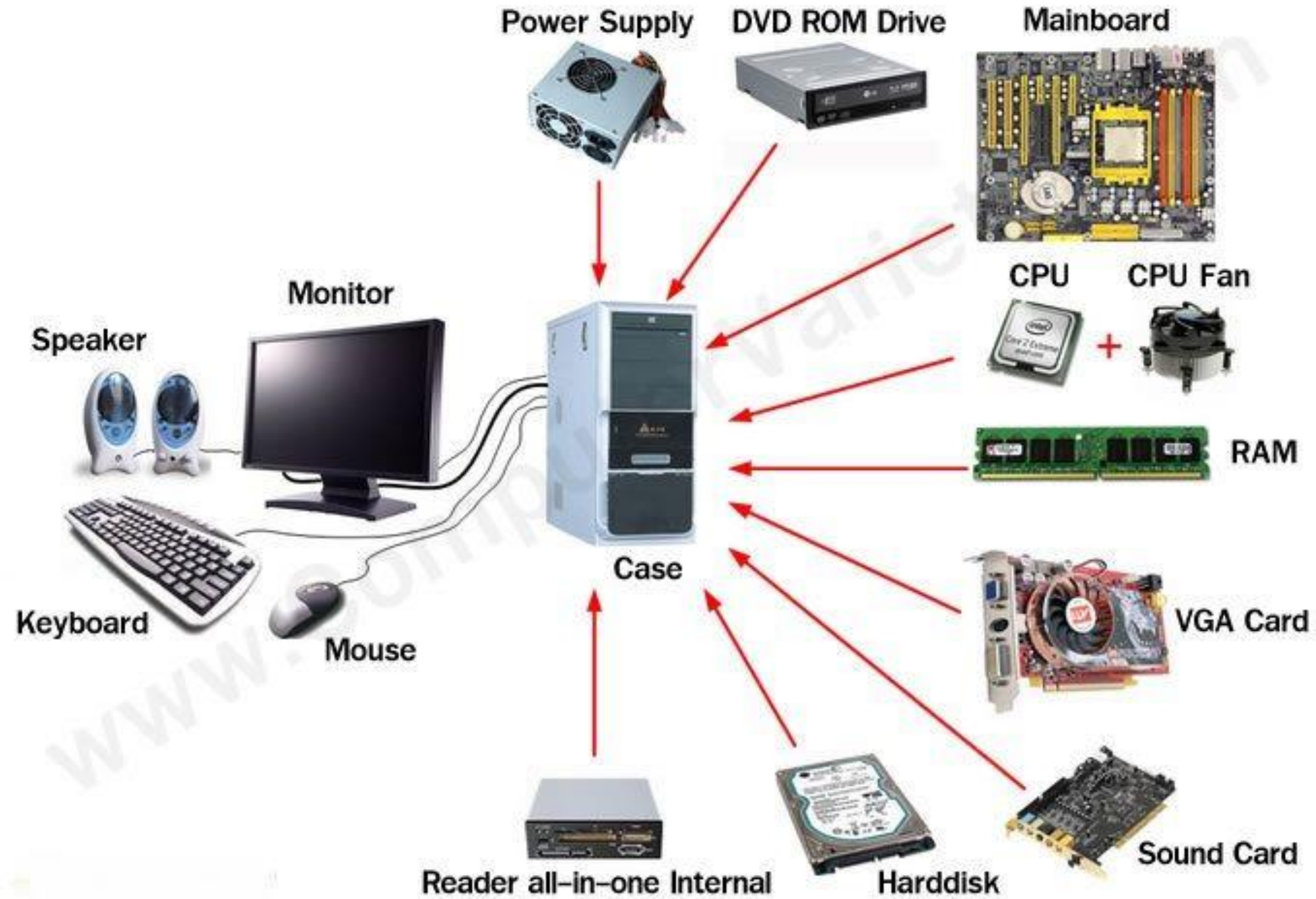
## Processor



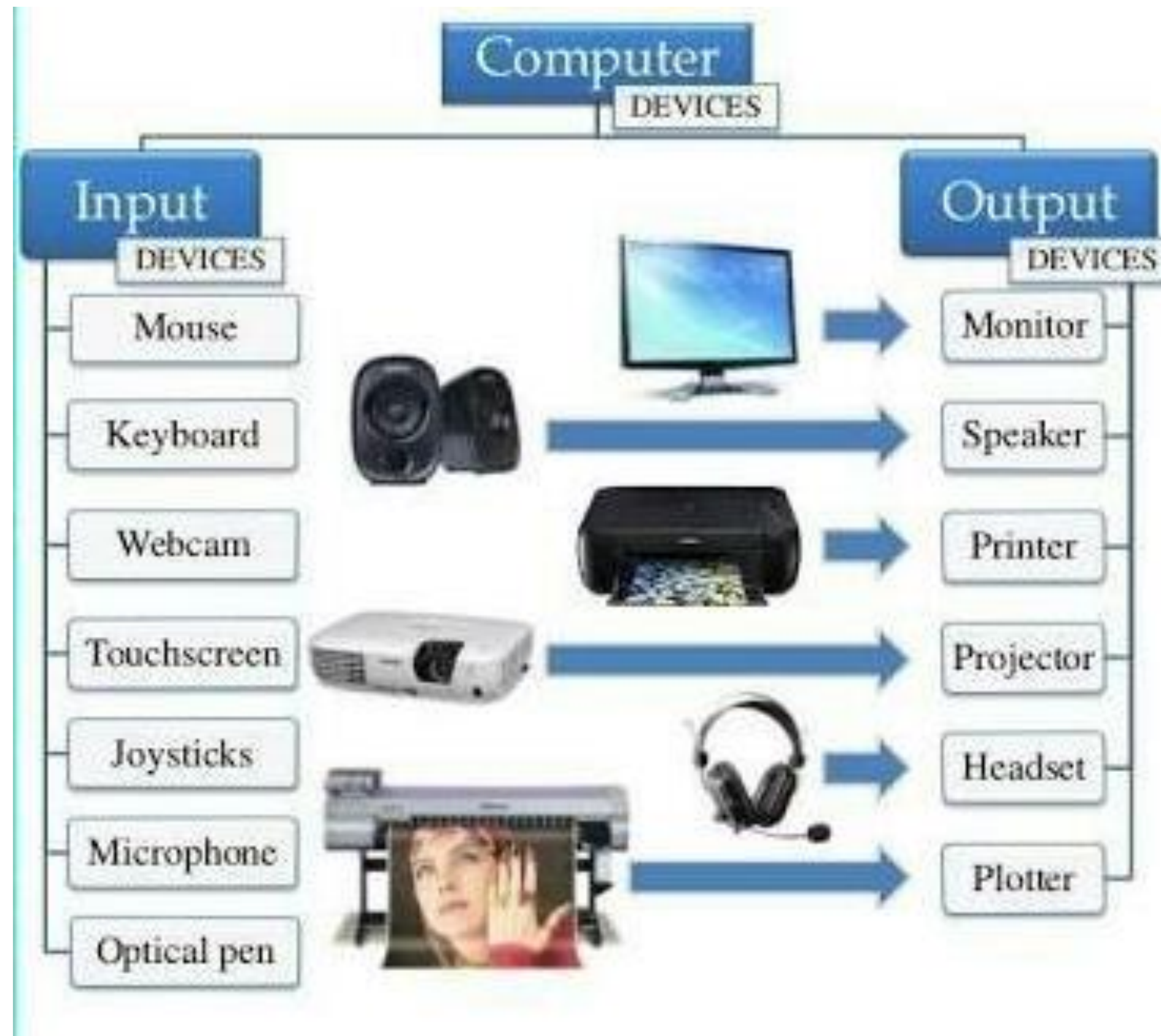
# Mother board







# I/O Devices







# Assessment 1



1. Write about generations of computer?

Ans : \_\_\_\_\_

2. List out hardware components of computer?

Ans : \_\_\_\_\_







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**Thank You**