What is computer

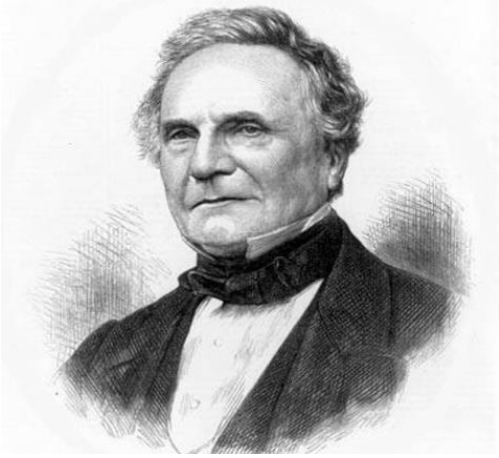
A computer is an electronic device that manipulates information, or data. It has the ability to store, retrieve, and process data. You may already know that you can use a computer to type documents, send email, play games, and browse the Web. You can also use it to edit or create spreadsheets, presentations, and even videos.

Definition: **An electronic machine that can store, find and arrange information, calculate amounts and control other machines**

History of computer

History of computer

Charles Babbage, an English mechanical engineer and polymath, originated the concept of a programmable computer. Considered the "father of the computer" he conceptualized and invented the first mechanical computer in the early 19th century.



Charles Babbage
“Father of Computer”

The idea was introduced in the late 1940s by John von Neumann, who proposed that a program be electronically stored in binary-number format in a memory device so that instructions could be modified by the computer as determined by intermediate computational results.

John von Neumann
Binary-number format

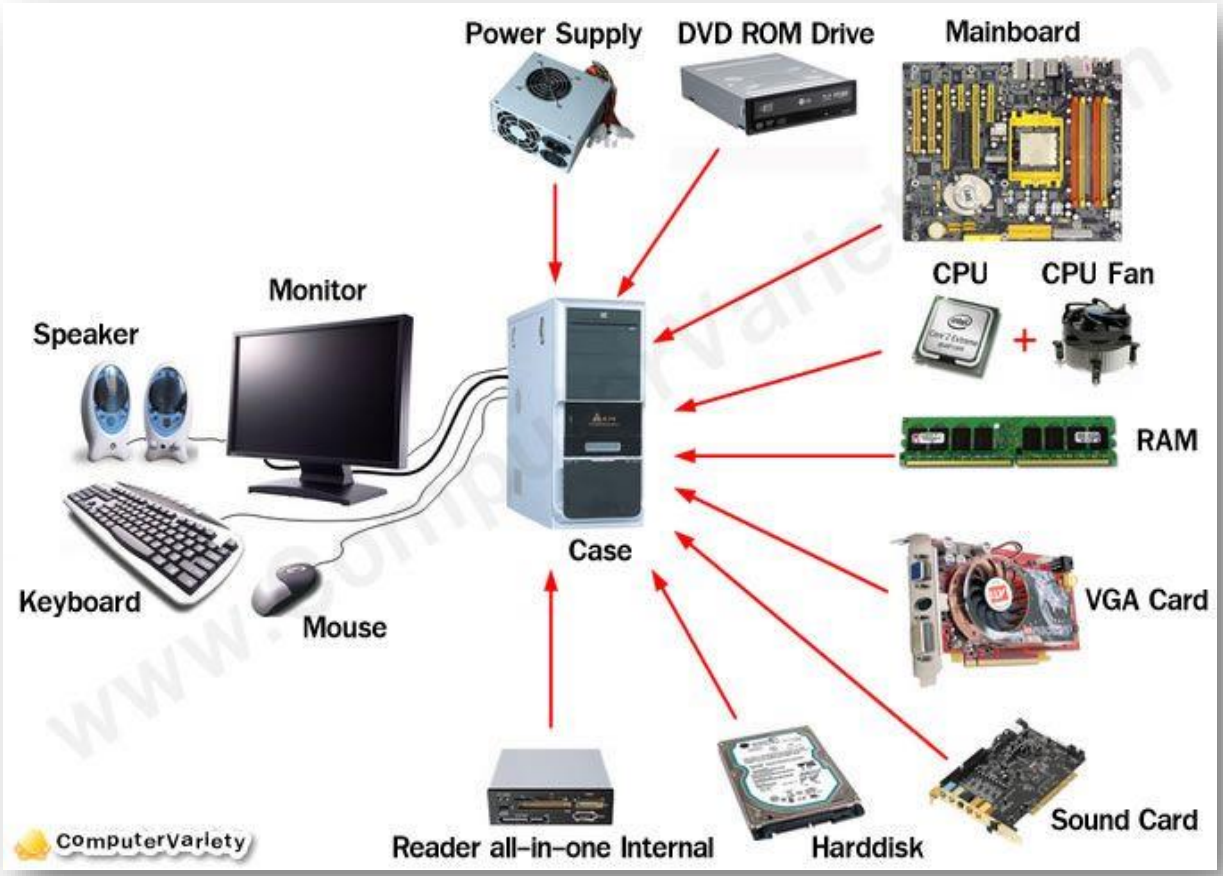
Components of computer

Before we talk about different types of computers, let's talk about two things all computers have in common:

Hardware

Software

Hardware is any part of your computer that has a physical structure, such as the keyboard or mouse. It also includes all of the computer's internal parts,



Software is any set of instructions that tells the hardware what to do and how to do it. Examples of software include web browsers, games, and word processors.

[Everything you do on your computer will rely on both hardware and software. For example, right now you may be viewing this lesson in a web browser (software) and using your mouse (hardware) to click from page to page. As you learn about different types of computers, ask yourself about the differences in their hardware. As you progress through this tutorial, you'll see that different types of computers also often use different types of software.]

Characteristics of Computer

1. High Speed (उच्च गति)
2. Accuracy (सटीकता)
3. Large Capacity (भंडारण क्षमता)
4. Reliability (विश्वसनीयता)
5. Versatility (विविधता)
6. Diligence (कर्मठता या निरन्तरता)
7. Automation (स्वचालन)
8. Multitasking (बहु-कार्यण)
9. Remembrance Power (स्मरण शक्ति)
10. Quick Decision (त्वरित निर्णय)
11. Efficiency (कार्य-कुशलता)
12. Secrecy (गोपनीयता)

Limitations of Computer

1. बुद्धिमता की कमी (Lack of Intelligence)
2. सामान्य बोध की कमी (Lack of Common Scene)
3. विद्युत पर निर्भरता (Dependence on electricity)
4. अपग्रेड और अपडेट (Upgrade and Update)
5. वायरस से खतरा (Virus threat)

Generations of Computers

Generations of Computers

A generation of computers refers to the specific improvements in computer technology with time. In 1946, electronic pathways called circuits were developed to perform the counting. It replaced the gears and other mechanical parts used for counting in previous computing machines.

In each new generation, the circuits became smaller and more advanced than the previous generation circuits. The miniaturization helped increase the speed, memory and power of computers. There are five generations of computers which are described below;

First Generation Computer's :-

The first generation (1946-1959) computers were slow, huge and expensive. In these computers, vacuum tubes were used as the basic components of CPU and memory. These computers were mainly depended on batch operating system and punch cards. Magnetic tape and paper tape were used as output and input devices in this generation;

Some of the popular first generation computers are;

- **ENIAC (Electronic Numerical Integrator and Computer)**
- **EDVAC (Electronic Discrete Variable Automatic Computer)**
- **UNIVACI(Universal Automatic Computer)**
- **IBM-701**
- **IBM-650**

First Generation of Computer
(1946-1959)

Vacuum Tubes

First Generation Computer - ENIAC

Second Generation Computers:-

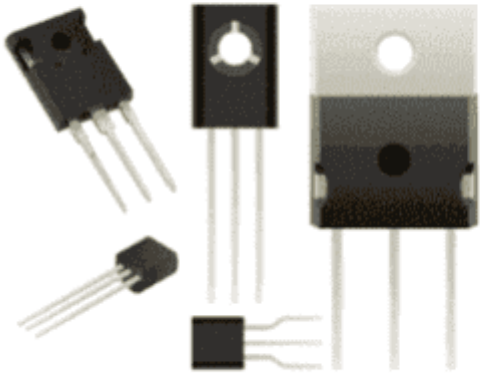
The second generation (1959-1965) was the era of the transistor computers. These computers used transistors which were cheap, compact and consuming less power; it made transistor computers faster than the first generation computers.

In this generation, magnetic cores were used as the primary memory and magnetic disc and tapes were used as the secondary storage. Assembly language and programming languages like COBOL and FORTRAN, and Batch processing and multiprogramming operating systems were used in these computers.

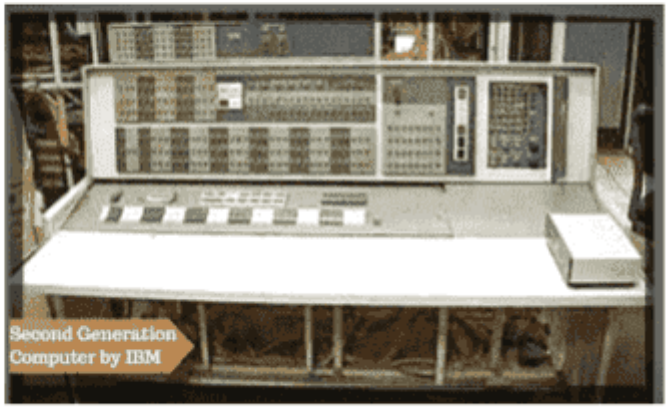
Some of the popular second generation computers are;

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

Second Generation of Computer
(1959-1965)



Transistors



Second Generation Computer by IBM

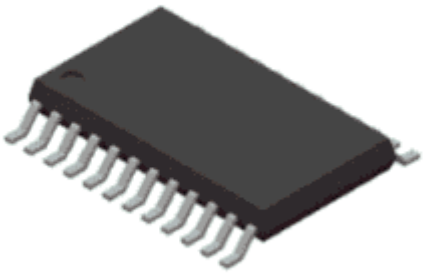
Third Generation Computers:-

The third generation computers used integrated circuits (ICs) instead of transistors. A single IC can pack huge number of transistors which increased the power of a computer and reduced the cost. The computers also became more reliable, efficient and smaller in size. These generation computers used remote processing, time-sharing, multi programming as operating system. Also, the high-level programming languages like FORTRON-II TO IV, COBOL, PASCAL PL/1, ALGOL-68 were used in this generation.

Some of the popular third generation computers are;

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

Third Generation of Computer
(1965-1971)



Integrated Circuit

Third Generation Computer by IBM

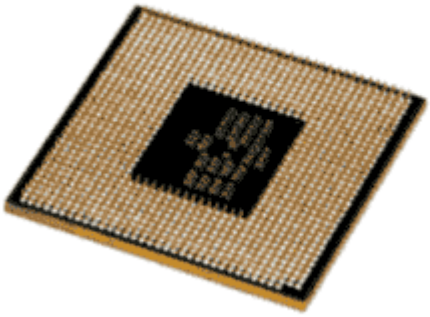
Fourth Generation Computers:-

The fourth generation (1971-1980) computers used very large scale integrated (VLSI) circuits; a chip containing millions of transistors and other circuit elements. These chips made this generation computers more compact, powerful, fast and affordable. These generation computers used real time, time sharing and distributed operating system. The programming languages like C, C++, DBASE were also used in this generation.

Some of the popular fourth generation computers are;

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

Fourth Generation of Computer
(1971-1980)



Microprocessor

Fourth Generation Computer by IBM

Fifth Generation Computers:-

In fifth generation (1980-till date) computers, the VLSI technology was replaced with ULSI (Ultra Large Scale Integration). It made possible the production of microprocessor chips with ten million electronic components. This generation computers used parallel processing hardware and AI (Artificial Intelligence) software. The programming languages used in this generation were C, C++, Java, .Net, etc.

Some of the popular fifth generation computers are;

- **Desktop**
- **Laptop**
- **Note Book**
- **Ultra Book**
- **Chrome Book**

Fifth Generation of Computer
(1980-Present)

Artificial Intelligence

Fifth Generation Computer - Desktop

Types of Computer

Types of Computer

We can categorize computer in three ways: on the basis of data handling capabilities, size and purpose.

- **On the basis of data handling capabilities, the computer is of three types:**

- **Analogue Computer**
- **Digital Computer**
- **Hybrid Computer**

1) Analogue Computer

Analogue computers are designed to process analogue data. Analogue data is continuous data that changes continuously and cannot have discrete values. We can say that analogue computers are used where we don't need exact values always such as speed, temperature, pressure and current.

Analogue computers directly accept the data from the measuring device without first converting it into numbers and codes. They measure the continuous changes in physical quantity and generally render output as a reading on a dial or scale. Speedometer and mercury thermometer are examples of analogue computers.

2) Digital Computer

Digital computer is designed to perform calculations and logical operations at high speed. It accepts the raw data as input in the form of digits or binary numbers (0 and 1) and processes it with programs stored in its memory to produce the output. All modern computers like laptops, desktops including smart phones that we use at home or office are digital computers.

3) Hybrid Computer

Hybrid computer has features of both analogue and digital computer. It is fast like an analogue computer and has memory and accuracy like digital computers. It can process both continuous and discrete data. It accepts analogue signals and convert them into digital form before processing. So, it is widely used in specialized applications where both analogue and digital data is processed. For example, a processor is used in petrol pumps that converts the measurements of fuel flow into quantity and price. Similarly, they are used in airplanes, hospitals, and scientific applications.

❖ **On the basis of size, the computer can be of *five* types:**

- **Supercomputer**
- **Mainframe computer**
- **Miniframe or Minicomputer**
- **Workstation**
- **Microcomputer**

1) Supercomputer

Supercomputers are the biggest and fastest computers. They are designed to process huge amount of data. A supercomputer can process trillions of instructions in a second. It has thousands of interconnected processors.

Supercomputers are particularly used in scientific and engineering applications such as weather forecasting, scientific simulations and nuclear energy research. The first supercomputer was developed by Roger Cray in 1976.

2) Mainframe computer

Mainframe computers are designed to support hundreds or thousands of users simultaneously. They can support multiple programs at the same time. It means they can execute different processes simultaneously. These features of mainframe computers make them ideal for big organizations like banking and telecom sectors, which need to manage and process high volume of data.

3) Miniframe or Minicomputer

It is a midsize multiprocessing computer. It consists of two or more processors and can support 4 to 200 users at one time. Miniframe computers are used in institutes and departments for tasks such as billing, accounting and inventory management. A minicomputer lies between the mainframe and microcomputer as it is smaller than mainframe but larger than a microcomputer.

4) Workstation

Workstation is a single user computer that is designed for technical or scientific applications. It has a faster microprocessor, a large amount of RAM and high speed graphic adapters. It generally performs a specific job with great expertise; accordingly, they are of different types such as graphics workstation, music workstation and engineering design workstation.

5) Microcomputer

Microcomputer is also known as a personal computer. It is a general-purpose computer that is designed for individual use. It has a microprocessor as a central processing unit, memory, storage area, input unit and output unit. Laptops and desktop computers are examples of microcomputers. They are suitable for personal work that may be making an assignment, watching a movie, or at office for office work.

- **On the basis of purpose, the computer can be of *two* types:**

- **General purpose**
- **Specific purpose**