

TYPES OF COMPUTERS

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1.2 Types of Computers

1. Classification based on operational principle:

Analog Computers:

The analog computer is almost an extinct type of computer these days. It is different from a digital computer in respect that analog computer can perform numerous mathematical operations simultaneously. It is also unique in terms of operation as it utilizes continuous variables for the purpose of mathematical computation. It utilizes mechanical, hydraulic, or electrical energy for operation.

Digital Computers:

Digital computer stores data in terms of digits (numbers) and proceeds in discrete steps from one state to the next. The states of a digital computer typically involve binary digits which may take the form of the presence or absence of magnetic markers in a storage medium, on-off switches or relays. In digital computers, even letters, words and whole texts are represented digitally. Unlike analog computers, digital computers can only approximate a continuum by assigning large numbers of digits to a state description and by proceeding in arbitrarily small steps.

Hybrid computers:

These types of computers are, as the name suggests, a combination of both Analog and Digital computers. The Digital computers which work on the principle of binary digit system of '0' and '1' can give very precise results. But the problem is that they are too slow and incapable of large scale mathematical operation. In the hybrid types of computers the Digital counterparts convert the analog signals to digital signals to perform Robotics and Process control.

2. Classification based on Physical Structure and the purpose of their use.

1. Main Frame Computers

These are computers used by large organizations like meteorological surveys and statistical institutes for performing bulk mathematical computations. They are core computers which are used for desktop functions of over one hundred people simultaneously.

2. Microcomputers

These are the most frequently used computers better known by the name of Personal computers. This is the type of computer meant for public use. The Personal Computers are varied as Desktop, Laptop and PDA.

Desktop

A desktop is intended to be used on a single location. The spare parts of a desktop computer are readily available at relative lower costs. Power consumption is not as critical as that in laptops. Desktops are widely popular for daily use in workplaces and households.

Laptop

Similar in operation to desktops, laptop computers are miniaturized and optimized for mobile use. Laptops run on a single battery or on external adapter that charges the computer batteries. They are enabled with an inbuilt keyboard, touch pad acting as a mouse and a liquid crystal display.

Personal Digital Assistants (PDA's)

It is a handheld computer and popularly known as a palmtop. It has a touch screen and a memory card for storage of data. PDAs can also be effectively used as portable audio players, web browsers and smart phones. Most of them can access the Internet by means of Bluetooth or Wi-Fi communication. Handhelds have touch screens that use with the finger or a stylus (a pen-shaped pointing tool).

Tablet PCs

Tablet PCs are mobile PCs that combine features of laptops and handhelds. Like laptops, they are powerful and have a built-in screen. Like handhelds, they allow to write notes or draw pictures on the screen, usually with a tablet pen instead of a stylus. They can also convert handwriting into typed text. Some Tablet PCs are "convertibles" with a screen that swivels and unfolds to reveal a keyboard underneath.

Workstation

Workstations are high-end, expensive computers that are made for more complex procedures and are intended for one user at a time. Some of the complex procedures consist of science, math and engineering calculations and are useful for computer design and manufacturing. Perhaps the first computer that might qualify as a "workstation" was the IBM 1620.

Server

A server is a central computer that contains collections of data and programs. Also called a network server, this system allows all connected users to share and store electronic data and applications. The server processes are devoted to sharing files and managing log on rights.

3. Minicomputers

In terms of size and processing capacity, minicomputers lie in between mainframes and microcomputers. Minicomputers are also called mid-range systems. The term began to be popularly used in the 1960s to refer to relatively smaller third generation computers. They took up the space that would be needed for a refrigerator or two and used transistor and core memory technologies. The 12-bit PDP-8 minicomputer of the Digital Equipment Corporation was the first successful minicomputer.

Embedded Computers (Micro Controller)

Microcontrollers are mini computers that enable the user to store data, do simple commands and tasks, with little or no user interaction with the processor. These single circuit devices have minimal memory and program length but can be integrated with other processors for more complex functionality. The smallest category of computer is called an embedded computer which is another term for microcontroller

4. Supercomputers

The highly calculation-intensive tasks can be effectively performed by means of supercomputers. Quantum physics, mechanics, weather forecasting, molecular theory are best studied by means of supercomputers. Their ability of parallel processing and their well-designed memory hierarchy give the supercomputers, large transaction processing powers.

Illustration

How does a Computer work?

Computers work through an interaction of **Hardware** and **Software**. **Hardware** refers to the parts of a computer that you can see and touch, including the case and everything inside it.

The most important piece of hardware is a tiny rectangular chip inside your computer called the **Central Processing Unit (CPU), or Microprocessor**. It's the "brain" of computer—the part that translates instructions and performs calculations.

Hardware

The hardware are the parts of computer itself including the Central Processing Unit (CPU) and related microchips and micro-circuitry, keyboards, monitors, case and drives (hard, CD, DVD, floppy, optical, tape, etc...). Other extra parts called peripheral components or devices include mouse, printers, modems, scanners, digital cameras and cards (sound, colour, and video) etc...

Software

Software refers to the instructions, or a program, that tells the hardware what to do. The software is all the programming that makes the computer runs; controlling everything that the computer does. A word processing program that can be used to write letters on the computer is also a type of software. The operating system (OS) is software that manages your computer and the devices connected to it. Two well-known operating systems are Windows and Macintosh operating system.
