Department of biology

COMPUTER SCIENCE

1 stage

chapter_2

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COMPUTER TYPES

Classification based on Operating Principles

Based on the operating principles, computers can be classified into one of the following types:

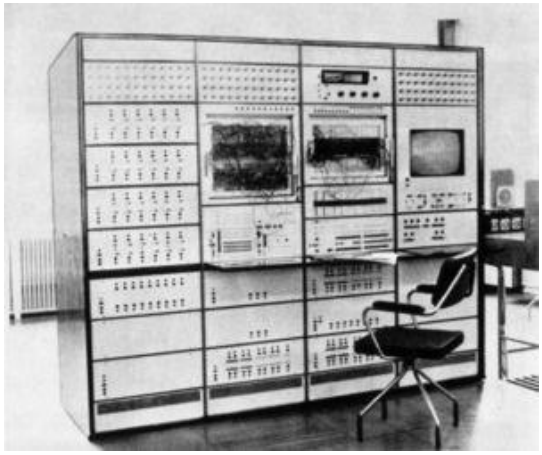
1) Digital Computers
2) Analog Computers
3) Hybrid Computers

Digital Computers: - Operate essentially by counting. All quantities are expressed as discrete or numbers. Digital computers are useful for evaluating arithmetic expressions and manipulations of data (such as preparation of bills, ledgers, solution of simultaneous equations etc).

Analog Computers:- An **analog computer** is a form of computer that uses the continuously changeable aspects of physical phenomena such as electrical, mechanical, or hydraulic quantities to model the problem being solved. In contrast, digital computers represent varying quantities symbolically, as their numerical values change.

Hybrid Computers:- are computers that exhibit features of analog computers and digital computers. The digital component normally serves as the controller

and provides logical operations, while the analog component normally serves as a solver of differential equations



<u>Classification digital Computer based on size and Capability</u> Based on size and capability, computers are broadly classified into ***<u>Micro Computers(Personal Computer)</u>***

A microcomputer is the smallest general purpose processing system. The older pc started 8 bit processor with speed of 3.7MB and current pc 64 bit

processor with speed of 4.66 GB. Examples: - **IBM PC**s, **APPLE** computers

Microcomputer can be classified into 2 types:

1. Desktops
2. Portables

The difference is portables can be used while travelling whereas desktops computers cannot be carried around.

The different portable computers are: -

1) Laptop
2) Notebooks
3) Palmtop (hand held)
4) Wearable computers

Laptop: - this computer is similar to a desktop computers but the size is smaller. They are expensive than desktop. The weight of laptop is around 3 to 5 kg.

Notebook: - These computers are as powerful as desktop but size of these computers are comparatively smaller than laptop and desktop. They weigh 2 to 3 kg. They are more costly than laptop.

Palmtop (Hand held): - They are also called as personal Digital Assistant (PDA). These computers are small in size. They can be held in hands. It is capable of doing word processing, spreadsheets and hand writing recognition, game playing, faxing and paging. These computers are not as powerful as desktop computers. Ex: - 3com palmV.

Wearable computer: - The size of this computer is very small so that it can be worn on the body. It has smaller processing power. It is used in the field of medicine. For example pace maker to correct the heart beats. Insulin meter to find the levels of insulin in the blood.

Workstations:- It is used in large, high-resolution graphics screen built in network support, Engineering applications(CAD/CAM), software development desktop publishing

Ex: Unix and windows NT.

b) **Minicomputer**: - A minicomputer is a medium-sized computer. That is more powerful than a microcomputer. These computers are usually designed to serve multiple users simultaneously (Parallel Processing). They are more expensive than microcomputers.

Examples: Digital Alpha, Sun Ultra.

c) **Mainframe (Enterprise) computers**: - Computers with large storage capacities and very high speed of processing (compared to mini- or microcomputers) are known as mainframe computers. They support a large number of terminals for simultaneous use by a number of users like ATM transactions. They are also used as central host computers in distributed data processing system.

Examples: - **IBM 370, S/390.**

d) **Supercomputer**: - Supercomputers have extremely large storage capacity and computing speeds which are many times faster than other computers. A supercomputer is measured in terms of tens of millions Instructions per second (mips), an operation is made up of numerous instructions. The supercomputer is mainly used for large scale numerical problems in scientific and engineering disciplines such as Weather analysis.

Examples: - **IBM Deep Blue**

Classification based on number of microprocessors

Based on the number of microprocessors, computers can be classified into

a) Sequential computers and

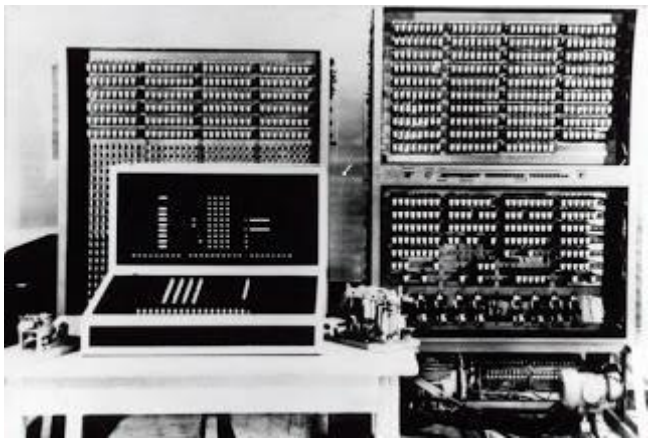
b) Parallel computers

a) **Sequential computers**: - Any task complete in sequential computers is with one microcomputer only. Most of the computers (today) we see are sequential computers where in any task is completed sequentially instruction after instruction from the beginning to the end.

b) **Parallel computers**: - The parallel computer is relatively fast. New types of computers that use a large number of processors. The processors perform different tasks independently and simultaneously thus improving the speed of execution of complex programs dramatically. Parallel computers match the speed of supercomputers at a fraction of the cost.

Classification based on word-length

A binary digit is called **"BIT"**. A word is a group of bits which is fixed for a computer. The number of bits in a word (or word length) determines the representation of all characters in these many bits. Word length leis in the range from 16-bit to 64-bitsf or most computers of today.



Classification based on number of users

Based on number of users, computers are classified into: -

Single User: - Only one user can use the resource at any time.

Multi User: - A single computer shared by a number of users at any time.

Network: - A number of interconnected autonomous computers shared by a number of users at any time.