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What is Computer ?

A computer is an electronic data processing device, which accepts and stores data input, processes the data input, and generates the output in a required format.

Functionalities of a Computer

We look at it in a very broad sense, any digital computer carries out the following five functions:
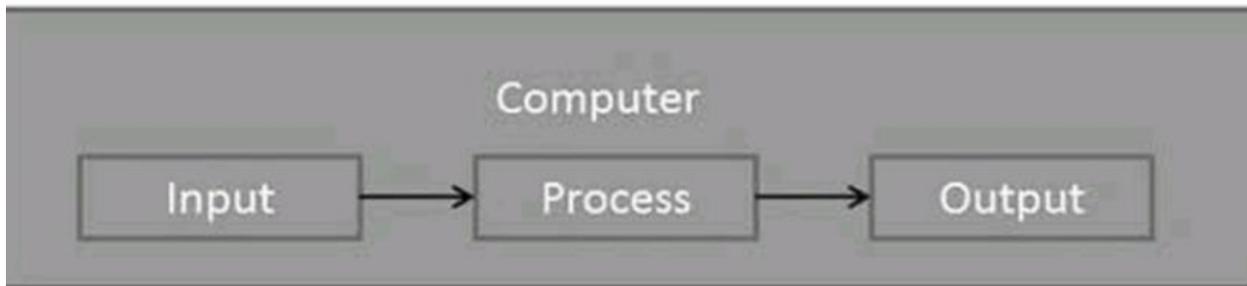
Step 1 - Takes data as input.

Step 2 - Stores the data/instructions in its memory and uses them as required.

Step 3 - Processes the data and converts it into useful information.

 Step 4 - Generates the output.

Step 5 - Controls all the above four steps

Comparison between human brain and computer

Computer	Human Brain
1. Computers are digital.	1. Human Brains are analogue.
2. Computers, information in memory is accessed by polling its precise memory address.	2. Human brain uses content-addressable memory.
3. Computers are modular and serial.	3. Human Brain is a massively parallel machine.
4. Processing speed depend on processor.	4. Processing speed is not fixed in the brain. there is no system clock.
5. Computer has no thinking power, it's depend on user instruction.	5. Human brain have thinking power.
6. Hardware/software distinction can be made with respect to the Computer.	6. No hardware/software distinction can be made with respect to the brain.
7. Computer is touchable component.	7. Human brain is not touchable.

Characteristic of Computers -

Characteristic of computers are follows:-

1. High Speed
2. Accuracy
3. Storage Capability
4. Diligence
5. Versatility
6. Reliability
7. Automation
8. Reduction in Paper Work and Cost

1 High Speed

- Computer is a very fast device.
- It is capable of performing calculation of very large amount of data.
- The computer has units of speed in microsecond, nanosecond, and even the picosecond.
- It can perform millions of calculations in a few seconds as compared to man who will spend many months to perform the same task.

2 Accuracy

- In addition to being very fast, computers are very accurate.
- The calculations are 100% error free.
- Computers perform all jobs with 100% accuracy provided that the input is correct.

3 Storage Capability

- Memory is a very important characteristic of computers.
- A computer has much more storage capacity than human beings.
- It can store large amount of data.
- It can store any type of data such as images, videos, text, audio, etc.

4 Diligence

- Unlike human beings, a computer is free from monotony, tiredness, and lack of concentration.
- It can work continuously without any error and boredom.

- It can perform repeated tasks with the same speed and accuracy.

5 Versatility

- A computer is a very versatile machine.
- A computer is very flexible in performing the jobs to be done.
- This machine can be used to solve the problems related to various fields.
- At one instance, it may be solving a complex scientific problem and the very next moment it may be playing a card game.

6 Reliability

- A computer is a reliable machine.
- Modern electronic components have long lives.
- Computers are designed to make maintenance easy.

7 Automation

- Computer is an automatic machine.
- Automation is the ability to perform a given task automatically. Once the computer receives a program i.e., the program is stored in the computer memory, then the program and instruction can control the program execution without human interaction.

8 Reduction in Paper Work and Cost

- The use of computers for data processing in an organization leads to reduction in paper work and results in speeding up the process.
- As data in electronic files can be retrieved as and when required, the problem of maintenance of large number of paper files gets reduced.
- Though the initial investment for installing a computer is high, it substantially reduces the cost of each of its transaction.

Limitation of Computer

Limitation of computer are follows:-

No I.Q.

- A computer is a machine that has no intelligence to perform any task.
- Each instruction has to be given to the computer.
- A computer cannot take any decision on its own.

Dependency.

- It functions as per the user's instruction, thus it is fully dependent on humans. Environment.
- The operating environment of the computer should be dust free and suitable.

No Feeling

- Computers have no feelings or emotions.
- It cannot make judgment based on feeling, taste, experience, and knowledge unlike humans.

Computer Applications-

We will discuss the application of computer in various fields.

Business

A computer has high speed of calculation, diligence, accuracy, reliability, or versatility which has made it an integrated part in all business organizations. Computer is used in business organizations for:

o Payroll calculations
o Budgeting
o Sales analysis
o Financial forecasting
o Managing employee database
o Maintenance of stocks, etc.

Banking

Today, banking is almost totally dependent on computers. Banks provide the following facilities:

o Online accounting facility, which includes checking current balance, making deposits and overdrafts, checking interest charges, shares, and trustee records.
o ATM machines which are completely automated are making it even easier for customers to deal with banks.

Insurance

Insurance companies are keeping all records up-to-date with the help of computers. Insurance companies, finance houses, and stock broking firms are widely using computers for their concerns. Insurance companies are maintaining a database of all clients with information showing:

o Procedure to continue with policies.
o Starting date of the policies.
o Next due installment of a policy.
o Maturity date
o Interests due
o Survival benefits
o Bonus

Education

The computer helps in providing a lot of facilities in the education system.

o The computer provides a tool in the education system known as CBE (Computer Based Education).

- CBE involves control, delivery, and evaluation of learning.
- Computer education is rapidly increasing the graph of number of computer students.
- There are a number of methods in which educational institutions can use a computer to educate the students.
- It is used to prepare a database about performance of a student and analysis is carried out on this basis.

Marketing

In marketing, uses of the computer are following:
- **Advertising** - With computers, advertising professionals create art and graphics, write and revise copy, and print and disseminate ads with the goal of selling more products.
- **Home Shopping** - Home shopping has been made possible through the use of computerized catalogues that provide access to product information and permit direct entry of orders to be filled by the customers.

Healthcare

Computers have become an important part in hospitals, labs, and dispensaries. They are being used in hospitals to keep the record of patients and medicines. It is also used in scanning and diagnosing different diseases. ECG, EEG, ultrasounds and CT scans, etc. are also done by computerized machines.

Following are some major fields of health care in which computers are used.
- **Diagnostic System** - Computers are used to collect data and identify the cause of illness.
- **Lab-diagnostic System** - All tests can be done and the reports are prepared by computer.
- **Patient Monitoring System** – These are used to check the patient's signs for abnormality such as in Cardiac Arrest, ECG, etc.
- **Pharma Information System** - Computer is used to check drug labels, expiry dates, harmful side effects, etc.
- **Surgery** - Nowadays, computers are also used in performing surgery.

Engineering Design

Computers are widely used for Engineering purpose. One of the major areas is CAD (Computer Aided Design) that provides creation and modification of images.

Some of the fields are:

- o **Structural Engineering** – Requires stress and strain analysis for design of ships, buildings, budgets, airplanes,etc.
- o **Industrial Engineering** – Computers deal with design, implementation, and improvement of integrated systems of people, materials, and equipment.
- o **Architectural Engineering** - Computers help in planning towns, designing buildings, determining a range of buildings on a site using both 2D and 3D drawings.

Military

Computers are largely used in defence. Modern tanks, missiles, weapons, etc. Military also employs computerized control systems. Some military areas where a computer has been used are:

- o Missile Control
- o Military Communication
- o Military Operation and Planning
- o Smart Weapons

Communication

Communication is a way to convey a message, an idea, a picture, or speech that is received and understood clearly and correctly by the person for whom it is meant. Some main areas in this category are:

- o E-mail
- o Chatting
- o Usenet
- o FTP
- o Telnet
- o Video-conferencing

Government

Computers play an important role in government services. Some major fields in this category are:

- o Budgets
- o Sales tax department
- o Income tax department
- o Computation of male/female ratio
- o Computerization of voters lists
- o Computerization of PAN card
- o Weather forecasting