



Computer Skills

SE level 1

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Main Objectives:

1. To learn about computer and its characteristics and features.
2. History of computer and its different generations.
3. Comparing different types of computers.



CHAPTER 1

Introduction To Computers

Computer is the most used device today, whether at homes, schools, universities, or research institutions, as well as in companies, bodies, factories, and various workplaces. Computer is also used to facilitate human work and to help in implementing many functions and tasks with high efficiency and without boredom. Moreover, it has affected the development of all sciences and knowledge, and added more discoveries.

Defining Of Computer

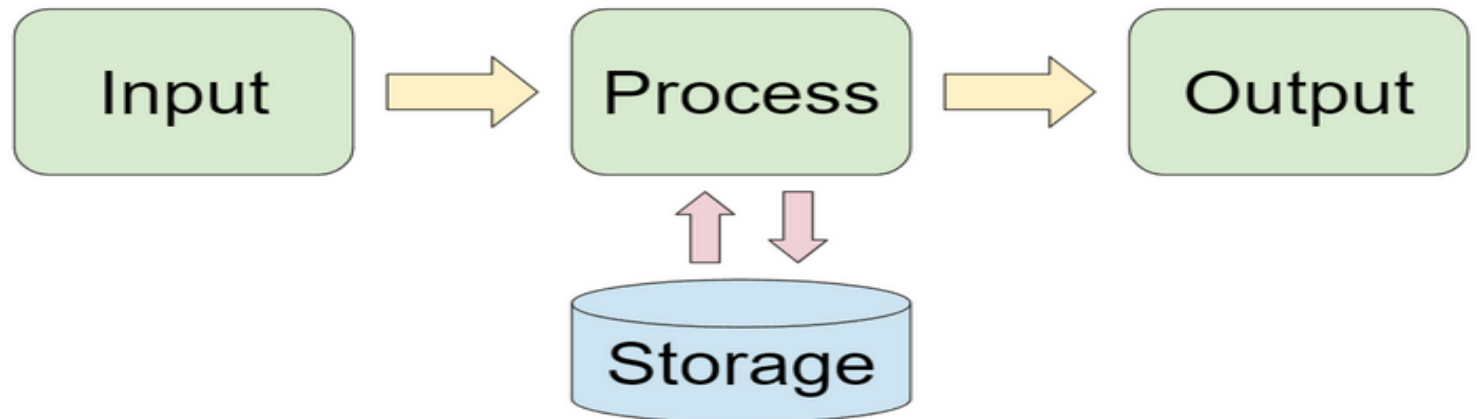
Definition of computer There is no specific and agreed definition for the computer, but there are many definitions that explain how a computer works and express its main characteristics. We can agree in **defining the computer** as :

“An electronic device that receives data (inputs) and processes it by performing a set of operations (mathematical and logical) at high speed and infinitely accurate along with the ability to store huge amounts of data and information and retrieve them (outputs) when needed according to specific conditions”.

Functionalities Of A Computer

Any digital computer carries out five functions in gross terms:

- Takes data as input.
- Stores the data/instructions in its memory and can use them when required.
- Process the data and convert it into useful information.
- Output the information.
- Control all the above four steps.



Computer Advantages

- **High Speed** : The ability of a computer to perform tasks and process data quickly.
- **Accuracy** : The capability of a computer to perform calculations and processes without errors.
- **Reliability** : The consistency of a computer to perform operations without failures over time.
- **Storage Capability** : The ability of a computer to store large amounts of data and information.
- **Flexibility** : The ability of a computer to perform a variety of tasks and run different types of applications.
- **Resource Sharing** : The capability of a computer to share resources, such as files and printers, with other computers over a network.
- **Automation** : Computer is a automatic machine. Automation means ability to perform the task automatically.
- **Reduction In Cost** : Though the initial investment for installing a computer is high but it substantially reduces the cost of each of its transaction.

Computer Disadvantages

- **No intelligence quotient (I.Q)** : A computer is a machine and has no intelligence of its own to perform any task.
- **Dependency** : It can perform function as instructed by user . So it is fully dependent on human being.
- **Environment** : The operating environment of computer should be dust free and suitable to it.
- **No Feeling** : Computer has no feeling or emotions.

Computer Applications

1. Business

A computer has high speed of calculation, accuracy, reliability has made it an integrated part in all business organizations.

Computer used in business organization for:

- Payroll Calculations.
- Budgeting.
- Sales Analysis.
- Financial forecasting.
- Managing employees database.



Computer Applications ...

2. Banking

Today Banking is almost totally dependent on computer.

Banks provide following facilities:

- Banks on-line accounting facility, which include :
 - Current balances, deposits, overdrafts, interest charges.
 - Shares and trustee records.
- ATM machines are making it even easier for customers to deal with banks.



Computer Applications ...

3. Education :

- The computer has provided a lot of facilities in the Education System.
- The uses of computer provide a tool in the Education system is known as CBE (Computer Based Education).
- The computer education is very familiar and rapidly increasing the graph of computer students.
- There are number of methods in which educational institutions can use computer to educate the students.

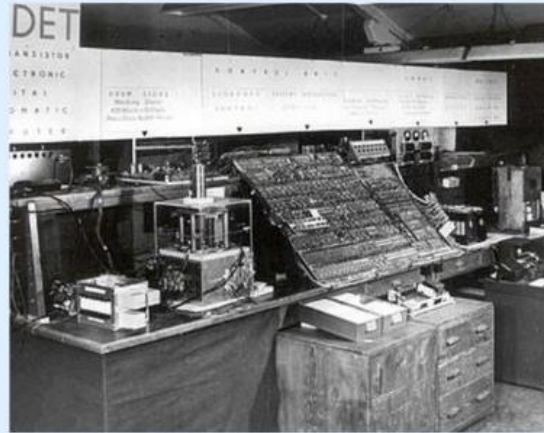


Computer Applications ...

Also, there are many computer applications, including:

- **Military.**
- **Engineering Design.**
- **Health Care.**
- **Marketing.**
- **Government Applications.**
- **Communication.**

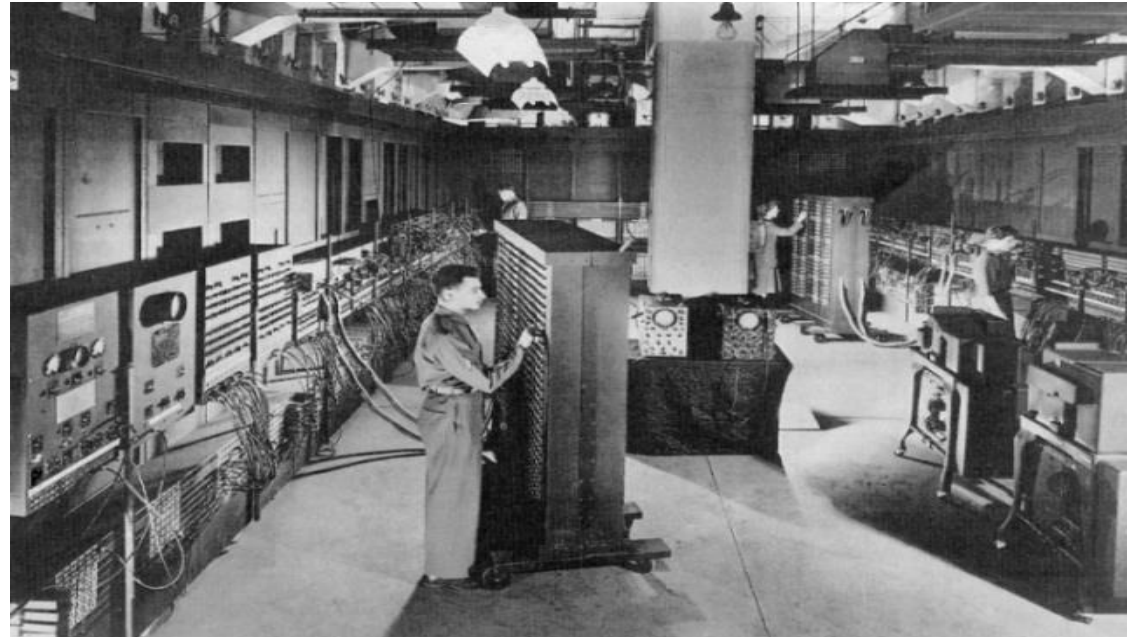
Generations Of Computers



First Generation (1945 - 1958) - Vacuum Tubes

The main features of First Generation are:

- Vacuum tube technology
- Unreliable
- Supported Machine language only
- Very costly
- Generate lot of heat
- Slow Input/Output device
- Huge size
- Need of A.C.
- Non portable
- Consumed lot of electricity



Some computer of this generation were:

- ENIAC .
- EDVAC .
- UNIVAC .

The Second Generation (1959 - 1964) - The Transistor

The main features of Second Generation are:

- Use of transistors.
- Reliable as compared to First generation computers.
- Smaller size as compared to First generation computers.
- Generate 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.
- A.C. needed.
- Support machine and assembly languages.



Some computer of this generation were:

- IBM 1620.
- IBM 7094.
- CDC 1604.

The Third Generation (1964 - 1970) - Integrated Circuits

The main features of Third Generation are:

- Integrated circuit (IC) technology used.
- More reliable.
- Smaller size.
- Generate less heat.
- Faster and lesser maintenance.
- Still costly.
- A.C needed.
- Consumed lesser electricity.
- Support high level language.
- Increase the main memory capacity.



Some computer of this generation were:

- IBM-360 series and IBM-370/168.
- Honeywell-6000 series.
- TDC-316.

The Fourth Generation (1970 - 1995) - Microprocessors

The main features of Fourth Generation are:

- Very-large-scale integration (VLSI) technology used.
- Very cheap and Very small size.
- Portable and reliable.
- Use of PC's.
- Pipeline processing.
- No A.C. needed.
- Concept of internet was introduced.
- Great developments in the fields of networks.
- Computers became easily available.
- Read Only Memory (ROM) and Random Access Memory (RAM) appeared.
- Higher level languages like C and C++, DBASE etc. were used in this generation.



Some computer of this generation were:

- DEC 10.
- STAR 1000.

Fifth Generation (1995-until Now) - Portable Smart Devices

The main features of Fifth Generation are:

- Ultra Large Scale Integration (ULSI) technology.
- Development of true artificial intelligence.
- Development of Natural language processing.
- Advancement in Parallel Processing.
- More user friendly interfaces with multimedia features.
- Availability of very powerful and compact computers at cheaper rates.
- All the Higher level languages like C and C++, Java, python .Net etc. are used in this generation.
- AI includes: Robotics, Neural networks, Game Playing.

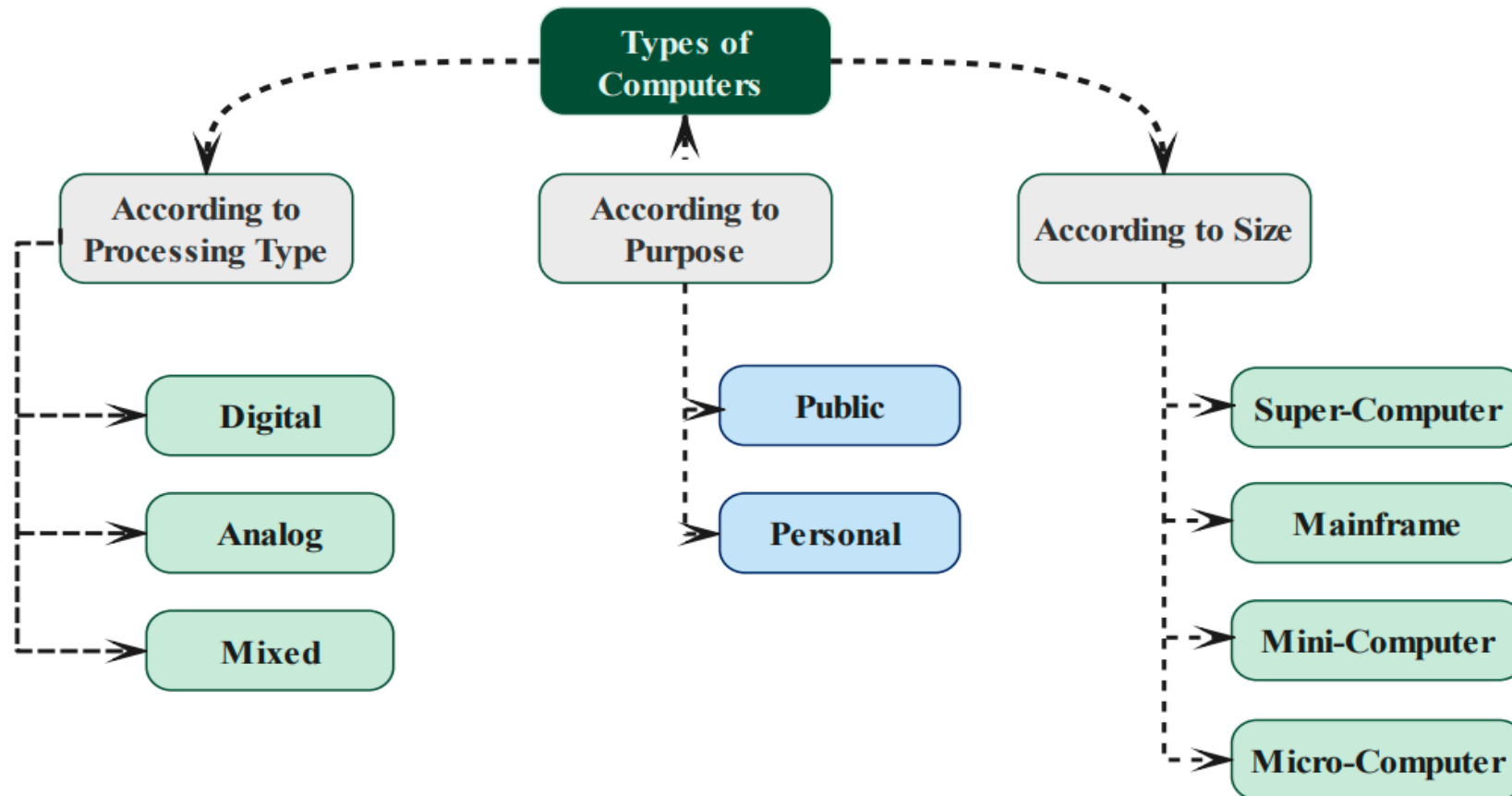


Some computer types of this generation are:

- Desktop, Laptop, Notebook.

Types Of Computers

Computers can be divided in many ways, depending on the standard seen when partitioning, and there are many criteria, as shown in Figure



Types Of Computers (According To Size)

Supercomputers : It is the largest computers, with special capabilities in either processing operations or storage capacity, and it is considered a highly advanced technology. Until recently, it was the preserve of the major countries only due to its huge potential. These computers are used in research centers such as the **NASA** Space Center, the US Department of Defense, and others, as well as in dangerous experiments such as nuclear tests.



Types Of Computers (According To Size)

The characteristics of Supercomputers

- It has hundreds of thousands of processors working together (up to more than 100,000 processors).
- It may speed more than 1000 trillion operations per second.
- It consumes very large amounts of electricity.
- It needs special cooling systems that result in huge temperatures.
- Most modern supercomputers use the Linux operating system or modified versions of it specifically to suit the capabilities of the device.
- The supercomputer weighs hundreds of tons and occupies a very large space.
- Pure gold or diamonds may go into the design of supercomputers

Types Of Computers (According To Size)

Minicomputers : is smaller than the previous computers, and this computer is often used in companies and government institutions that deal with a large number of customers in order to accomplish their administrative or other transactions, such as postal centers, social security and major commercial centers.



Types Of Computers (According To Size)

The characteristics of Mainframe

- It can run more than one operating system on the same device.
- It can operate more than one virtual machine, which is known as virtual machines.
- One large computer can substitute for hundreds of servers.
- It is used in giant institutions such as banks, airlines and others.
- It can serve thousands of users at the same time.
- Has huge processing capabilities and high speeds.
- Serves a wide range of computers (company branches - city).

Types Of Computers (According To Size)

Mainframe computer : Also known as central computers, this type of computer has been designed to serve the purposes of large corporations such as banks, factories, airlines, ministries, and major government agencies .



Types Of Computers (According To Size)

The characteristics of Minicomputer :

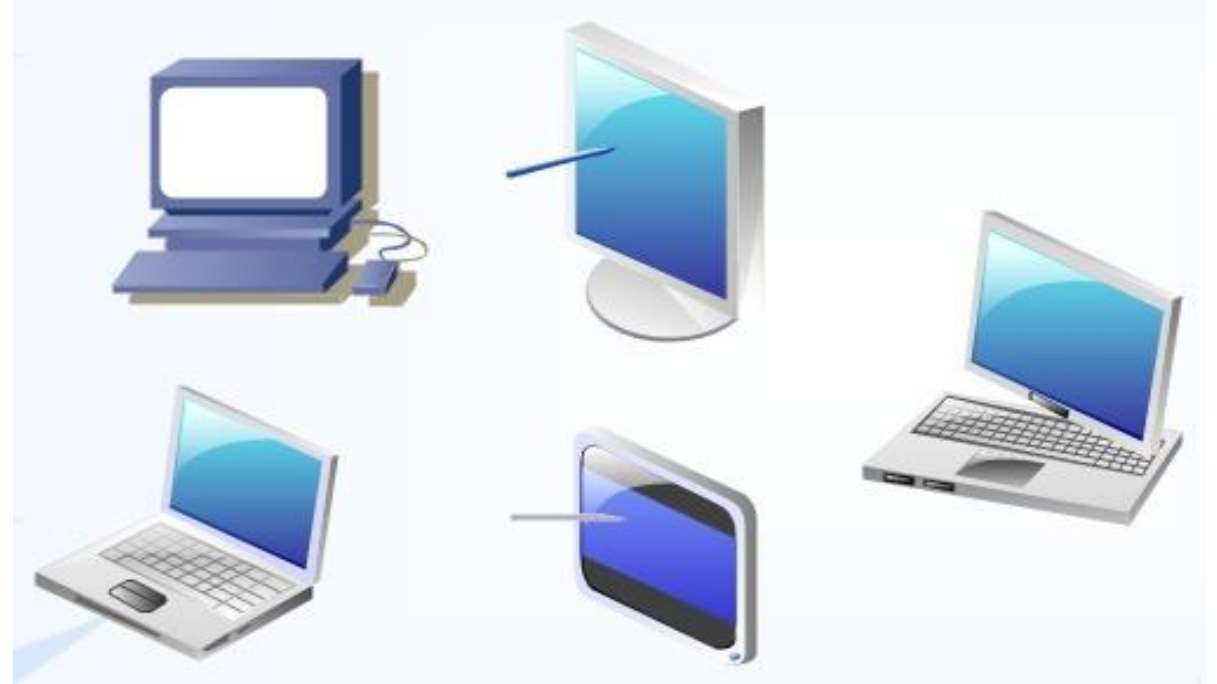
- Medium in size and smaller than the previous ones.
- Usually used as a service provider (server) for networks and the Internet.
- Designed to allow it to process multiple requests from different destinations.
- Adopts the Central Memory Unit, which is the subscription of several Client computers in one central system unit
- Any user can access the database stored on the central unit.
- It is used in major companies and government institutions to serve a large number of users.
- Any user can use the various sharable resources associated with this central unit (such as a printer, scanner, etc.)

Types Of Computers (According To Size)

Microcomputers : is the smallest in terms of size among other forms of previous computers, and the least in terms of processing and storage capabilities. They are usually equipped with one or more microprocessors to increase their operating capacity.

Microcomputers are divided into:

- Desktop
- Portable computers
- Personal Digital Assistant (PDA)
- Tablets



Types Of Computers (According To Size)

The characteristics of Microcomputer :

- Small in size and light in weight.
- It performs the same tasks as large computers, but slowly and with less information.
- It is characterized by its ability to process various types of data quickly and sufficiently to perform the various functions related to the business of individuals or institutions.
- Designed to perform various traditional computer functions such as writing, printing, browsing the Internet and designing images in addition to professional works such as montaging, writing programs, and others.
- There are many forms, including desktop, laptop, personal assistant, tablet, smart phone devices, etc.

