Chapter: - 1
Evolution of Computers

Overview of the chapter

➢ Different generations of computers

- First Generation: 1946-1958 (Vacuum Tubes)
- Second generation: 1959-1964 (Transistors)
- Third generation: 1965-1970 (Integrated Circuits IC)
- Fourth generation: 1971- today (Microprocessors)

➢ Categories of computers

- On the basis of working principle
- On the basis of size
- On the basis of brand

Introduction

✓ Computer are such an **integral part** of our everyday life.

✓ Computer is an electronic machine which performs mathematics and logical calculations.

✓ **Charles Babbage** is called the Father of computer.

✓ Now, in this chapter, we are trying to describe the types of computers and elaborate classification of computer.

✓ Computers can be classified in various ways depending on their generation, working, size and use.

Generations of Computer

- The term '**Generations**' means improvement in the development of a product (computer).

- Every new generation, the circuitry has gotten **smaller and more advances** than the previous generation.

- New discoveries are constantly being developed that effect the way of we live, work and play.

The first generation: 1946- 1958 (Vacuum Tubes)

o The Ist generation computers were huge, slow, expansive and often unreliable.

o In 1946 two Americans, **Presper Eckert** and **John Mauchly** built the ENIAC.

o ENIAC was made up of 18,000 vacuum tubes and occupied a 30 * 50 feet room.

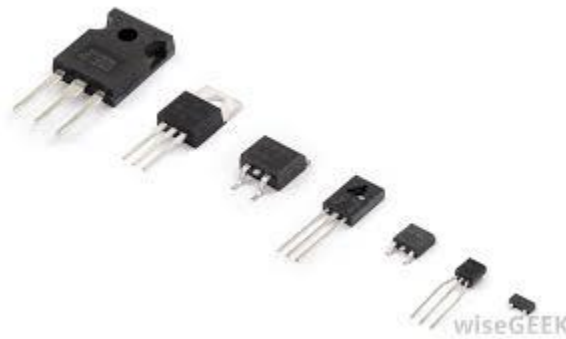o ENIAC stands for **Electronic Numeric Integration and Calculator**.

Key Features

❖ Vacuum tubes based, punched tape input or output, about 1,000 circuits per cubic foot.

Examples- ENIAC, IBM models 604,650(drum memory), 701,702,704,705,709 etc.

> **Things to remember**
>
> ENIAC was the world Ist successful electronic computer.

The Second generation: 1959-1964 (Transistors)

o As the development moved further, the second generation computer knocked the door.
o In 1947, three scientists, **John Bardeen William Shockley** and **Walter Brattain** working **at AT & T's Bell Labs** invented transistor.
o It was faster, more reliable, smaller & much cheaper to build than a vacuum.

o One transistor replaced the equivalents of 40 vacuum tubes.

o The size of computer also decreased and it became much smaller than that of earlier computer.

o Therefore, they were very cheap to produce.

Key Features

❖ Low electricity consumption.

❖ Mare reliable and faster.

❖ Used transistors, about 1,00,000 circuits per foot.

Examples – UNIVAC – III, IBM 7070, 7080,7090,1400,1600 series etc...

Third generation: 1965-1970 (Integrated Circuits IC)

o Invented in the year **1965**.

o In this generation of computer, IC (Integrated Circuits) was used as the electronic component for computers.

o The development of IC gave birth to a new felid of microelectronics.

o It is small in size, superior performance and reliability than the previous circuits.

o **Robert Noyce** of **Fairchild Corporation** & **Jack Kilby** of **Texas Instruments** discovered the integrated circuits.

Key Features

❖ Low power consumption.

❖ Large scale IC, 10 million circuits per square foot.

Examples – IBM 360 series, GE 235 etc…

The Fourth generation: 1971- today (Microprocessors)

o   This is the generation where we are working today. The computers which we see around us belong to the fourth generation computers.

o   By putting millions of transistors onto one single chip more calculation and faster speeds could be reaches by computers.

o   **Ted Hoff**, employed by **Intel** invented a chip.

o   The size of a pencil eraser that could so all the computing and logic of a computer.

o   It is evident that he next generation of computer i.e. **fifth generation** will be developed soon.

o   In that generation, computer will possess **artificial intelligence** and it would be able to take self-decisions like a human beings.
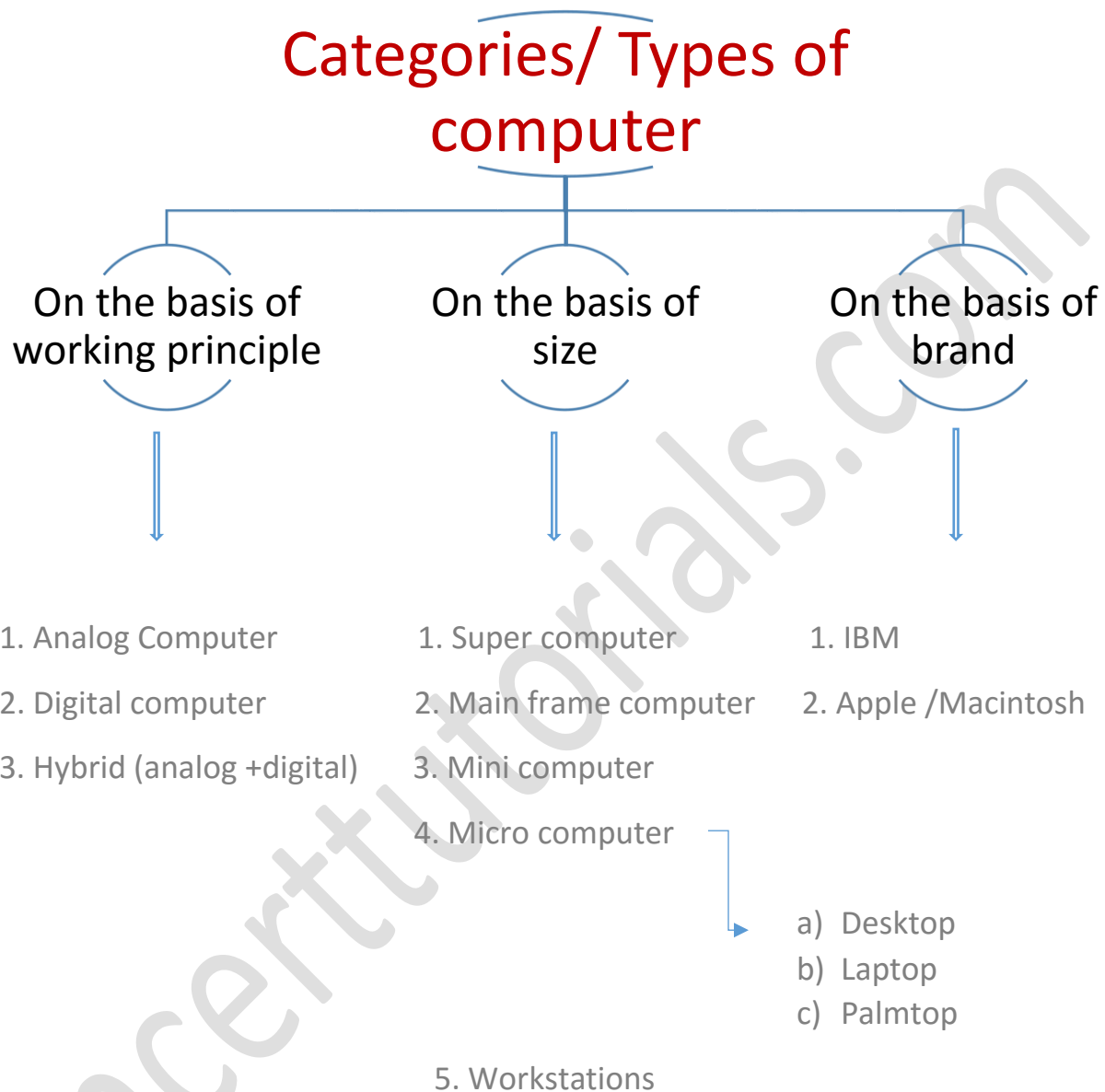
Key Features

❖ Very large scale integration billions of circuits per cubic foot.
❖ Portable computer developed.

**Examples**- IBM system 3090, HP 9,000 etc...

Things to remember

Supercomputers can execute a single program faster than a mainframe.

Categories/ Types of computer

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          ┌──────────────────────┼──────────────────────┐
   On the basis of        On the basis of        On the basis of
   working principle            size                   brand
          │                      │                      │
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On the basis of working principle	On the basis of size	On the basis of brand
1. Analog Computer	1. Super computer	1. IBM
2. Digital computer	2. Main frame computer	2. Apple /Macintosh
3. Hybrid (analog +digital)	3. Mini computer	
	4. Micro computer	
		a) Desktop
		b) Laptop
		c) Palmtop
	5. Workstations	

Analog computer

An analog computer is a computer that represents data by measurable quantities, as voltages than by expressing the data as numbers.

Example- Thermometer, speedometer, petrol pump indicator, multimeter etc.
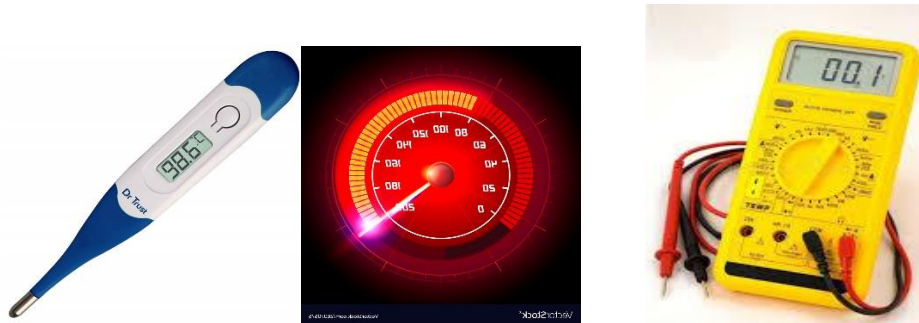
Digital computer

A digital computer is the most commonly used type of computer and is used to process information with quantities using digits, usually using the binary number system.

Hybrid (analog + digital) computer

A combination of computers those are capable of inputting and outputting in both digital and analog signals. A hybrid computer system setup offers a cost effective method of performing complex simulations.

On the basis of size

Supercomputer

A supercomputer is a computer that performs at or near the currently highest operational rate for computers.

It is mainly used for scientific and engineering applications that must handle very large databases or do a great amount of computation.

For example, weather forecasting requires a supercomputer.

Mainframe computer

It is very large and expensive computer capable of supporting 100 or even 1,000 of users at a time.

Mini computer

A computer with processing and storage capabilities smaller than those of mainframe but larger than those microcomputer.

Things to remember

A minicomputer is a multiprocessing system capable of supporting from 4 to 200 users at a time.

On the basis of Brand

IBM computers

It refers to a family of personal computers by IBM.

Apple/Macintosh computer

It is also known a Mac, is a line of personal computers (PC's) designed, developed, and marketed by Apple Inc.

Let Us Summaries

- Charles Babbage is called the 'Father of computer'.
- The first generation computer were huge, slow, expensive and often undependable.
- One transistor replaced the equivalent of 40 vacuum tube.
- Integrated circuit were used as the electronic component for computer.
- The microprocessor led toward the invention of personal computer or microcomputers.
- Digital computer processes information with quantities using digit usually using the binary number system.
- Hybrid computer is a combination of computer those are capable of inputting and outputting in both digital and analog signals.
- Supercomputer perform at or near the currently highest operational rate for computers.
- A minicomputer is a multiprocessing system capable of supporting from 4 to about 200 users simultaneously.
- Desktop Computer is personal or micro-mini computer sufficient to fit on a desk.
- Laptop is a portable computer complete with an integrated screen and keyboard.
- Palmtops have no keyboard but the screen serves both as an input and output device.