

- ➔ Read the Chapter Evolution of Computer (image attached) and Write the New Words in your word meaning copy and definitions also.

1

IN THIS CHAPTER

- ▶ Early computing devices
- ▶ Generations of computer

Evolution of Computer

Computer is not the outcome of a day or the efforts of an individual. It took many years and from time to time many people contributed into the development of present day computer. Let us peep into the past to understand the evolution of computer.

◆ **EARLY COMPUTING DEVICES**

The need of calculating devices was felt thousands of years ago and the humans always tried to develop devices to make calculations easier. Some of the earlier used calculating devices are discussed below.

Abacus

Abacus is considered as the first calculating device that was developed around 5000 years ago in China. It was made up of wooden frame with rods, each having beads. Simple calculations like addition or subtraction could be performed using this device.



Abacus

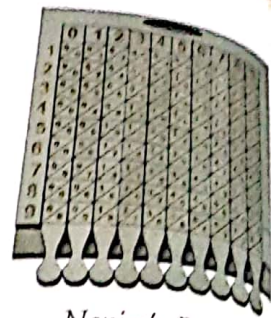
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Napier's Bones

This was invented by Sir John Napier, in 1614. It was made up of rods with numbers marked on them. Besides addition or subtraction, it was also used for multiplication and division.



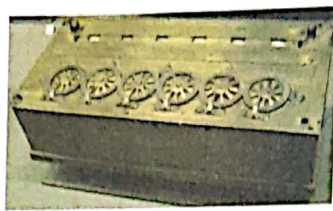
John Napier



Napier's Bones



Blaise Pascal



Pascaline Calculator

Pascaline Calculator

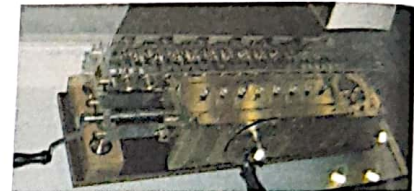
This was the first calculator, invented by Blaise Pascal in 1642. It consisted of a rectangular box with eight movable wheels. It was capable of performing addition and subtraction.

Leibniz Calculator

This calculator was an improvement in the Pascaline Calculator by W. Leibniz in 1671. It could perform addition, subtraction, multiplication and division.



Gottfried W. Leibniz



Leibniz Calculator

Difference Engine and Analytical Engine

In 1822, Charles Babbage designed the first mechanical calculating engine, called the *Difference Engine*. It could perform complex calculations.

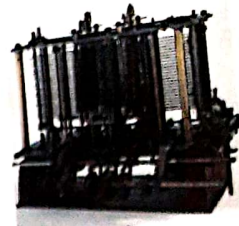
In 1833, he invented the first mechanical computer. The *Analytical Engine*, which laid the foundation of modern computers. It was able to perform any arithmetical calculation. It had input/output device, a memory unit and many other basic components of today's computers. This is why Charles Babbage is known as the *Father of Computers*.



Charles Babbage



Difference Engine



Analytical Engine

ENIAC and UNIVAC

With the advancement of technology, the first electronic general-purpose computer named **ENIAC** (Electronic Numerical Integrator and Computer) was developed in 1946 by J.P. Eckert and J. Mauchly. This was the first electronic computer which was the revolution in the field of computers.

UNIVAC I (Universal Automatic Computer I) was introduced in 1951. It was the first commercial computer.



J.P. Eckert and J. Mauchly



ENIAC



UNIVAC I

Quick Quiz

Ayan wrote the names of these early devices wrong. Help him rewrite them correctly.

1. PSACAINLE CALCLATROU
2. LIEBNZI CALCULTRO
3. BNOES ANPIRE
4. BACUSA
5. INEAC
6. DIFFEERCEN NIENGE



◆ GENERATIONS OF COMPUTER

Development of computer technology from ENIAC to its present form can be categorised in five generations. Let us discuss the technology used in each generation.

Features of First Generation Computers (1940-1956)

- ◆ Used vacuum tubes as the main component
- ◆ Were very expensive
- ◆ Generated lot of heat
- ◆ Slow input and output devices
- ◆ Were huge in size
- ◆ Consumed lot of electricity



Vacuum Tube

Some of the first generation computers are ENIAC, UNIVAC I, EDVAC.



ENIAC



UNIVAC I

Features of Second Generation Computers (1956-1963)

- ◆ Used transistors as the main component
- ◆ Were very expensive
- ◆ Generated less heat
- ◆ Were smaller in size
- ◆ Consumed less electricity
- ◆ Were faster

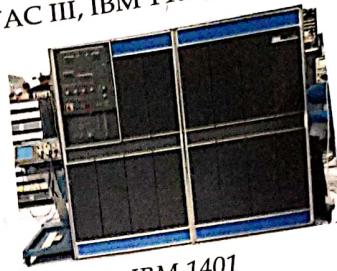


Transistor

Some computers of this generation were UNIVAC III, IBM 1401, CDC 3600.



UNIVAC III



IBM 1401



Full form of IBM is International Business Machine.

Features of Third Generation Computers (1964-1971)

- ◆ Used Integrated Circuits (ICs) as the main component
- ◆ Smaller size
- ◆ Generated less heat
- ◆ Were faster
- ◆ Were expensive
- ◆ Consumed lesser electricity



Integrated Circuit

Some computers of this generation were UNIVAC 900, IBM-360, ICL 1900.



IBM 360



ICL 1900

Features of Fourth Generation Computers (1972-present)

- ◆ Used VLSICs (Very Large Scale Integrated Circuits), called microprocessor as the main component
- ◆ Very cheap

- ♦ Very small in size
- ♦ Concept of Internet was introduced
- ♦ Became easily available



Microprocessor

Some computers of this generation are MITS Altair, Apple II, IBM PC, CRAY-1 supercomputer.



APPLE II



IBM PC



The microprocessor was developed by Ted Hoff of Intel in 1971.

Features of Fifth Generation Computers (Present-future)

- ♦ Development of Artificial Intelligence (a technology that allows computers to think and take self-decisions like a human being).
- ♦ Input and output will be in the form of speech and graphic
- ♦ Availability of very powerful and compact computers at cheaper rates

Some computers of this generation are desktop, laptop, tablet, robot, etc.



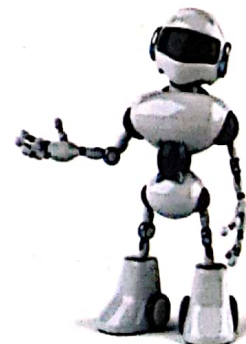
Desktop



Tablet



Laptop



Robot

Let's have a recap of the five generations of computers.

| Features | 1st generation | 2nd generation | 3rd generation | 4th generation | 5th generation |
|------------|----------------|----------------|----------------|----------------|-----------------|
| Technology | Vacuum tubes | Transistors | ICs | Microprocessor | AI |
| Speed | Slow | Fast | Faster | Faster | Fastest |
| Size | Very big | Big | Smaller | Smaller | Smallest |
| Cost | Very expensive | Very expensive | Expensive | Affordable | Very affordable |



Vocabulary

Evolution: change and development of something over years

Integrated: combine things to form a whole

Microprocessor: thousands of ICs built into a chip



Recap

- ♦ Abacus is considered as the first calculating device used by the man.
- ♦ The first calculator was designed by Blaise Pascal and was named Pascaline calculator.
- ♦ The first mechanical calculating engine named Difference Engine, was invented by Charles Babbage.
- ♦ Difference Engine is considered as the first mechanical calculating engine.
- ♦ ENIAC was the first electronic computer.
- ♦ UNIVAC was the first commercial computer.
- ♦ Computers are categorised into five generations.
- ♦ The first generation was based on vacuum tube technology.
- ♦ The second generation was based on transistors.
- ♦ The third generation was based on IC technology.
- ♦ The fourth generation is based on VLSI technology.
- ♦ Fifth generation computers are the future computers, which will be based on Artificial Intelligence.



SCRATCH YOUR BRAIN

A. Tick (✓) the correct answer and fill in the blank.

1. _____ is known as the father of computer.

☐

Blaise Pascal

☐

Charles Babbage

☐

John Napier

2. _____ technology was used in the first generation computers.

☐

IC

☐

VLSI

☐

Vacuum Tube

3. The fifth generation computers will be based on _____.

☐

Transistor

☐

AI

☐

IC

B. Match the following:

1. ENIAC

2. IBM 360

3. UNIVAC III

4. Apple II

5. Artificial Intelligence

Fifth Generation

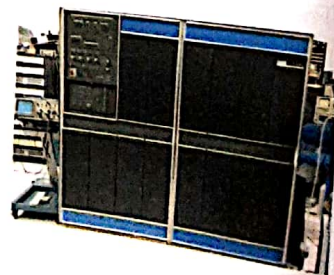
Fourth Generation

Third Generation

Second Generation

First Generation

C. Name the generation these computers belong to.



D. Answer these questions.

1. What is an Abacus?

2. Who invented the Leibniz calculator?

3. Which technology was used in first and second generation computers?

4. Name some of the computers developed during the third and fourth generation.








FUN ACTIVITY

To Do

Make a chart paper on 'Technology Used In Each Generation of Computer'. Draw or paste pictures.

TECHNOLOGY USED IN EACH GENERATION OF COMPUTER

| 1st generation | 2nd generation | 3rd generation | 4th generation | 5th generation |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |  |  |
| Vacuum tube | Transistor | Integrated Circuit | Microprocessor | Artificial Intelligence |