Session 2

Introduction to Computer Hardware: History of Computer

Prof Sunita Chauhan

Faculty of Engineering and Technology

Ganpat University
॥ विद्यया समाजोत्कर्षः ॥

History of Computer

- History of computer is divided into two parts.

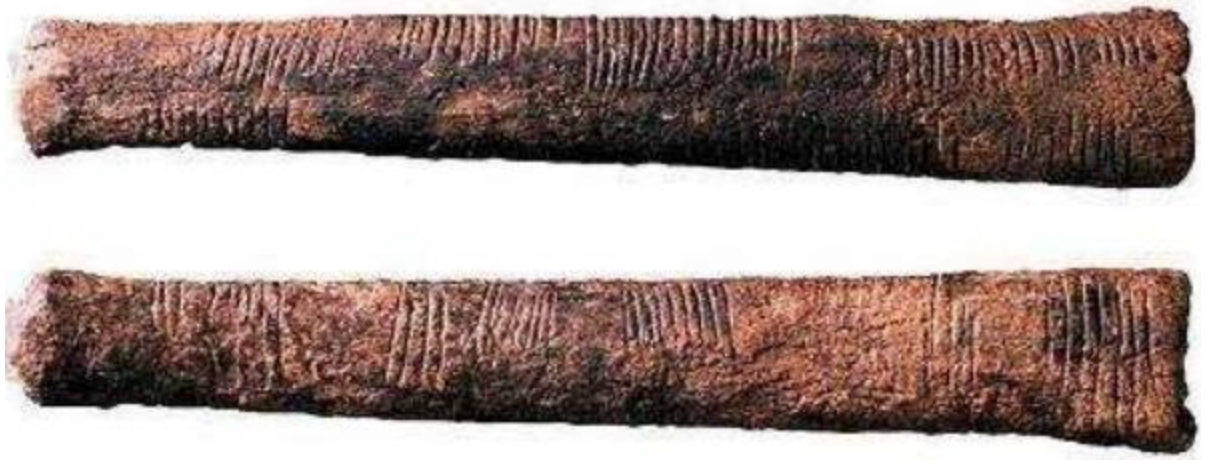
1. The Mechanical Era
2. The Electronic Era

History of Computer

- The Mechanical Era

1. Tally Sticks

- A tally stick was an ancient memory aid device to record and document numbers, quantities, or even messages.



History of Computer

- The Mechanical Era

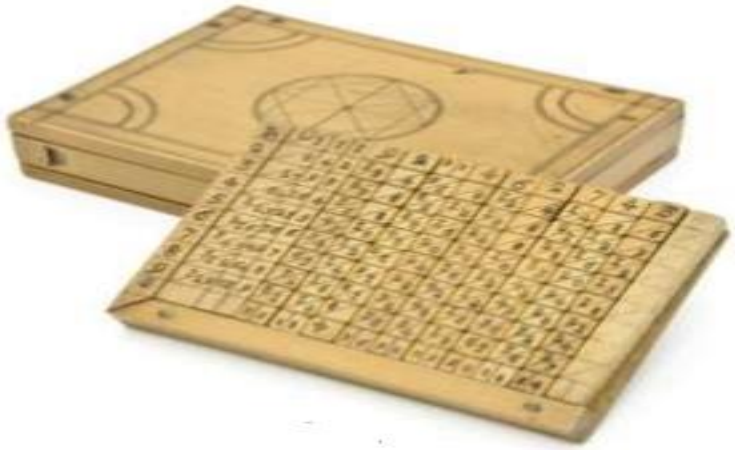
1. **Abacus**

- An abacus is a mechanical device used to aid an individual in performing mathematical calculations.
- The abacus was invented in Babylonia in 2400 B.C.
- The abacus was first used in China in around 500 B.C.
- It used to perform basic arithmetic operations.

History of Computer

2. **Napier's Bones**

- Invented by John Napier in 1614.
- Allowed the operator to multiply, divide and calculate square and cube roots by moving the rods around and placing them in specially constructed boards.



History of Computer

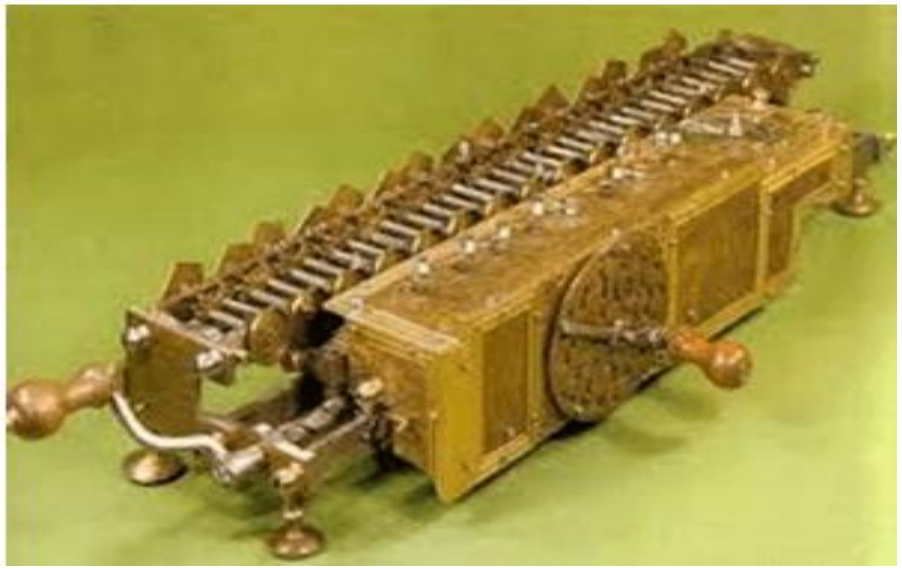
3. **Pascaline**

- Invented by Blaise Pascal in 1642.
- It was its limitation to addition and subtraction.
- It is too expensive

History of Computer

4. **Stepped Reckoner**

- Invented by Gottfried Wilhelm Leibniz in 1672.
- The machine that can add, subtract, multiply and divide automatically.

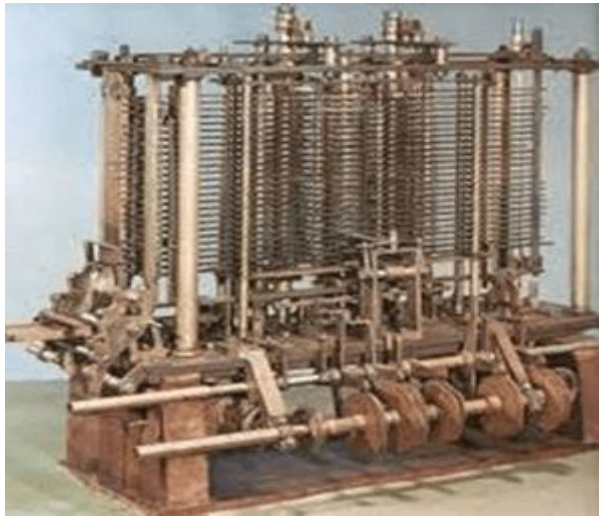


History of Computer

5. **Difference Engine and Analytical Engine**

- It’s an automatic, mechanical calculator designed to tabulate polynomial functions.
- Invented by Charles Babbage (Father of Computer) in 1822 and 1834.
- It is the first mechanical computer.

Difference Engine



Analytical Engine

History of Computer

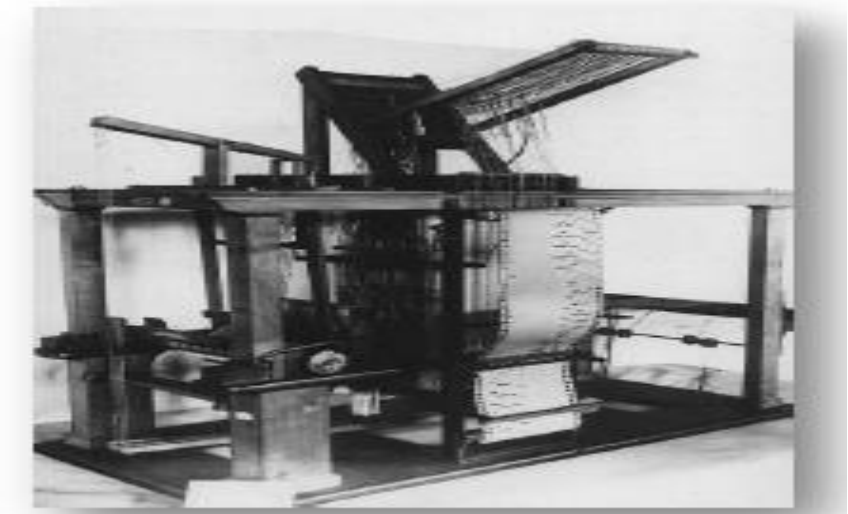
6. **Arithmometer**

- A mechanical calculator invented by Thomas de Colmar in 1820.
- The first reliable, useful and commercially successful calculating machine.
- The machine could perform the four basic mathematic functions.

History of Computer

7. **Jacquard Loom**

- The Jacquard loomis a mechanical loom, invented by Joseph-Marie Jacquard in 1881.
- It an automatic loom controlled by punched cards.

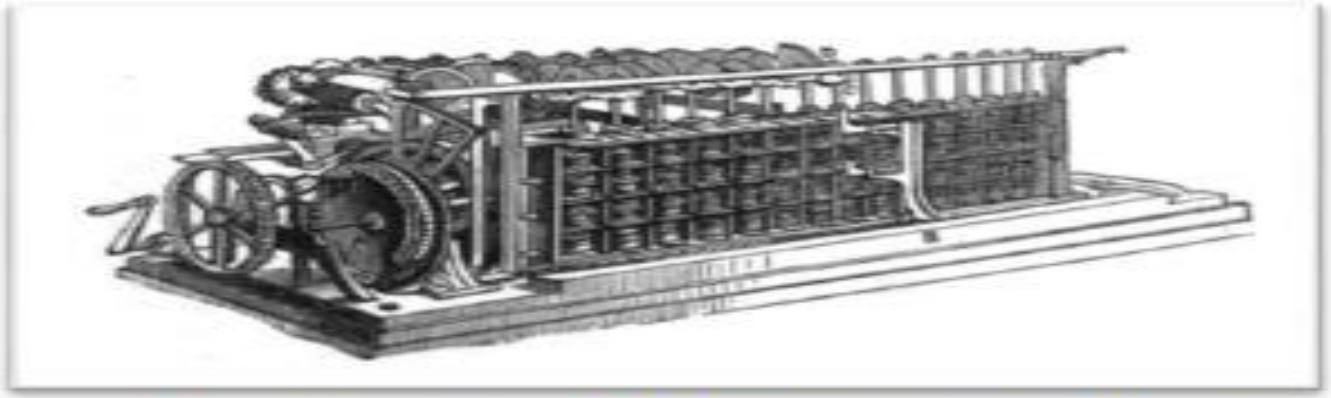


Jacquard Loom

History of Computer

8. **Scheutzian Calculation Engine**

- Invented by Per Georg Scheutz in 1843.
- Based on Charles Babbage's difference engine.
- The first printing calculator.



Scheutzian Calculation Engine

History of Computer

9. **Tabulating Machine**

- Invented by Herman Hollerithin 1890.
- To assist in summarizing information and accounting.

Tabulating Machine

History of Computer

10. **Z1**

- The first programmable computer.
- Created by Konrad Zusein Germany from 1936 to 1938.
- To program the Z1 required that the user insert punch tape into a punch tape reader and all output was also generated through punch tape

Z1

History of Computer

11. **Atanasoff-Berry Computer (ABC)**

- It was the first electronic digital computing device.
- Invented by Professor John Atanasoff and graduate student Clifford Berry at Iowa State University between 1939 and 1942.

Atanasoff-Berry Computer

History of Computer

12. **ENIAC**

- ENIAC stands for Electronic Numerical Integrator and Computer.
- It was the first electronic general purpose computer.
- Completed in 1946.
- Developed by John Presper Eckert and John W. Mauchly.

ENIAC

History of Computer

13. **UNIVAC 1**

- The UNIVAC I(UNIVersal Automatic Computer 1) was the first commercial computer.
- Designed by J. Presper Eckert and John Mauchly.

UNIVAC 1

History of Computer

14. **EDVAC**

- EDVAC stands for Electronic Discrete Variable Automatic Computer
- The First Stored Program Computer
- Designed by Von Neumann in 1952.
- It has a memory to hold both a stored program as well as data.

EDVAC

History of Computer

The First Computer Company

- The first computer company was the **Electronic Controls Company.**
- •Founded in 1949 by **J. Presper Eckert** and **John Mauchly**.

History of Computer

Computer Generations

There are five generations of computer:

- First Generation – 1946 – 1958
- Second generation – 1959 – 1964
- Third generation – 1965 – 1970
- Fourth generation – 1971 – today
- Fifth generation – Today to future

History of Computer

The First Generation

- The first computers used **vacuum tubes** for circuitry and **magnetic drums** for memory, and were often enormous, taking up entire rooms.
- They were very expensive to operate and in addition to using a great deal of electricity, generated a lot of heat, which was often the cause of malfunctions.

Vacuum tube

History of Computer

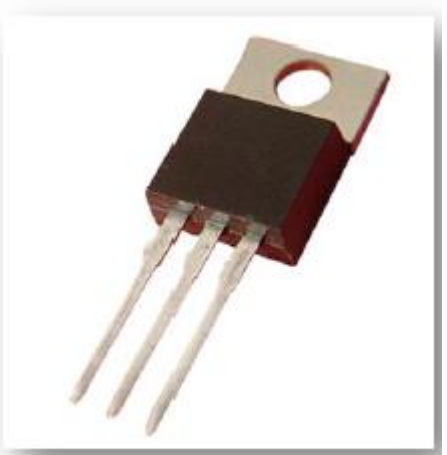
The First Generation

- First generation computers relied on machine language, the lowest-level programming language understood by computers, to perform operations, and they could only solve one problem at a time.
- Input was based on punched cards and paper tape, and output was displayed on printouts.

History of Computer

The Second Generation

- Transistors replaced vacuum tubes and ushered in the second generation of computers.
- One transistor replaced the equivalent of **40 vacuum tubes**.
- Allowing computers to become smaller, faster, cheaper, more energy-efficient and more reliable.
- Still generated a great deal of heat that can damage the computer.



Transistor

History of Computer

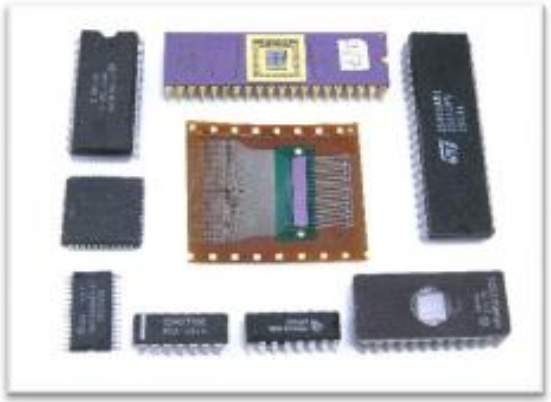
The Second Generation

- Second-generation computers uses assembly languages which allowed programmers to specify instructions in words.
- Second-generation computers still relied on punched cards for input and printouts for output.
- These were also the first computers that stored their instructions in their memory.

History of Computer

The Third Generation

- The development of the **integrated circuit** was the hallmark of the third generation of computers.
- Transistors were miniaturized and placed on silicon chips, called semiconductors, which drastically increased the speed and efficiency of computers.



Integrated Circuit

- Much smaller and cheaper compare to the second generation computers.
- It could carry out instructions in billionths of a second.

History of Computer

The Third Generation

- Users interacted with third generation computers through keyboards and monitors and interfaced with an operating system, which allowed the device to run many different applications at one time with a central program that monitored the memory.

- Computers for the first time became accessible to a mass audience because they were smaller and cheaper than their predecessors.

History of Computer

The Fourth Generation

- The **microprocessor** brought the fourth generation of computers, as thousands of integrated circuits were built onto a single silicon chip.
- As these small computers became more powerful, they could be linked together to form networks, which eventually led to the development of the Internet.
- Fourth generation computers also saw the development of GUIs, the mouse and handheld devices.

Microprocessor

History of Computer

The Fifth Generation

- Based on Artificial Intelligence (AI).
- Still in development.
- The use of parallel processing and superconductors is helping to make artificial intelligence a reality.
- The goal is to develop devices that respond to natural language input and are capable of learning and self-organization.
- There are some applications, such as voice recognition, that are being used today.