



EVOLUTION OF COMPUTER

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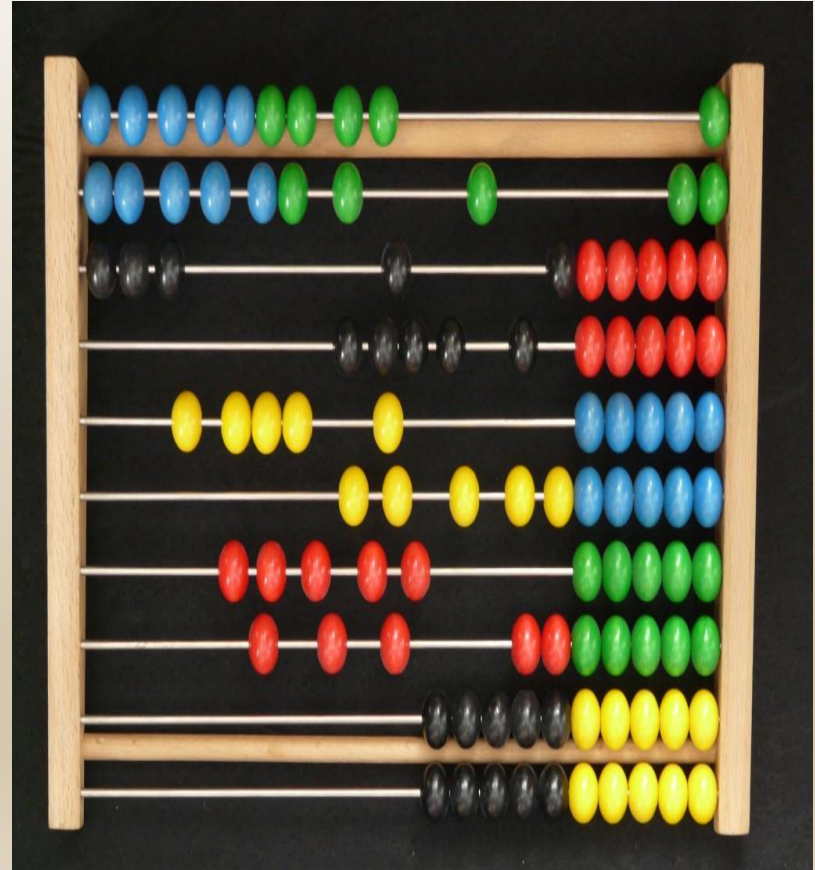


Evolution of computer systems

Computers evolved from the first Mechanical device named as ABACUS, to Electromechanical device and then to modern electronic Digital Computer.

Evolution of Computer systems

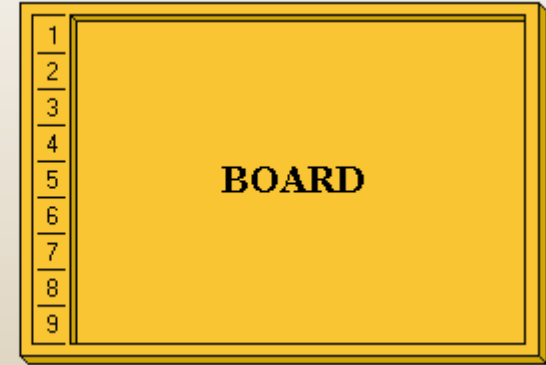
- ❑ **ABACUS**- Many centuries ago when man started to count the numbers, he thought of a device which can trace the numbers and thus came the existence of ABACUS.
- ❑ It was the first counting device which was developed in China more than 3000 years ago. The name Abacus was obtained from Greek word Abax which means slab.
- ❑ This device basically consists of a rectangular wooden frame and beads.
- ❑ The frame contains horizontal rods and the beads which have holes are passed through the rods.
- ❑ Counting was done by moving the beads from one end of the frame to the other.



Evolution of Computer systems

- ❑ **Napier's Bones**- It is a device which contains a set of rods made of bones.
- ❑ It was developed by John Napier, a Scottish Mathematician and hence the device was named as Napier's Bones.
- ❑ The device was mainly developed for performing multiplication and division.
- ❑ Later in 1614 he also introduced logarithms.

$7 \times 1 =$	7
$7 \times 2 =$	14
$7 \times 3 =$	21
$7 \times 4 =$	28
$7 \times 5 =$	35
$7 \times 6 =$	42
$7 \times 7 =$	49
$7 \times 8 =$	56
$7 \times 9 =$	63

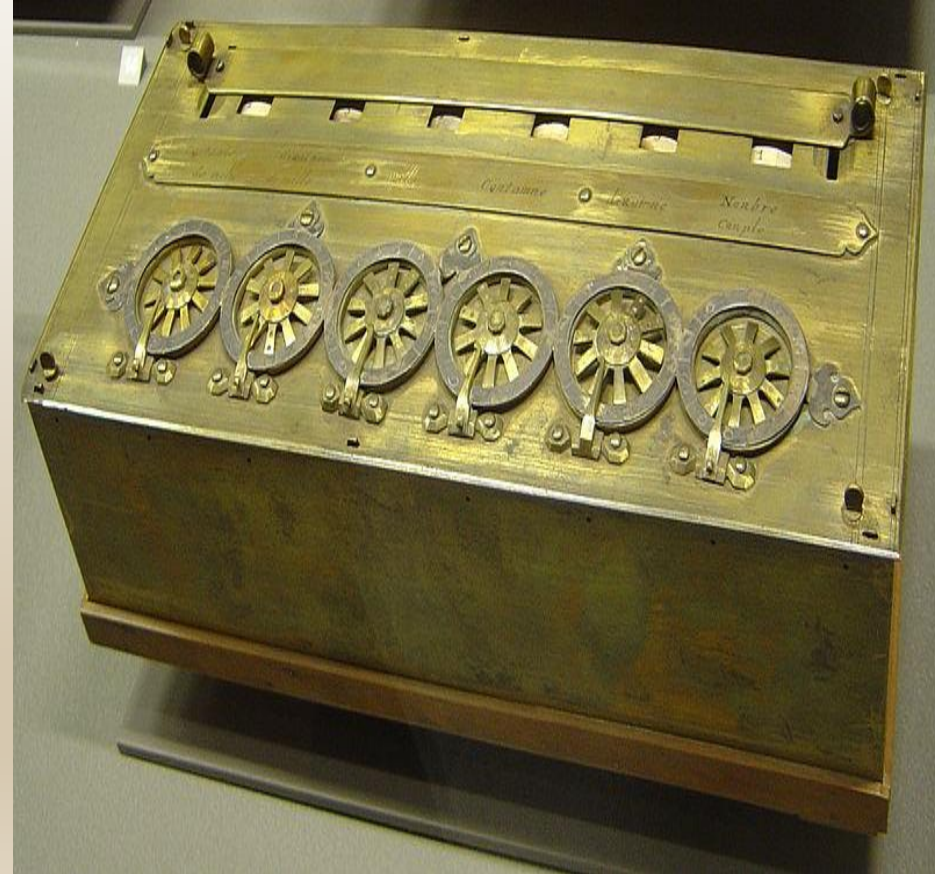


1	2	3	4	5	6	7	8	9	0
0/1	0/2	0/3	0/4	0/5	0/6	0/7	0/8	0/9	0/0
1/1	1/2	1/3	1/4	1/5	1/6	1/7	1/8	1/9	1/0
2/1	2/2	2/3	2/4	2/5	2/6	2/7	2/8	2/9	2/0
3/1	3/2	3/3	3/4	3/5	3/6	3/7	3/8	3/9	3/0
4/1	4/2	4/3	4/4	4/5	4/6	4/7	4/8	4/9	4/0
5/1	5/2	5/3	5/4	5/5	5/6	5/7	5/8	5/9	5/0
6/1	6/2	6/3	6/4	6/5	6/6	6/7	6/8	6/9	6/0
7/1	7/2	7/3	7/4	7/5	7/6	7/7	7/8	7/9	7/0
8/1	8/2	8/3	8/4	8/5	8/6	8/7	8/8	8/9	8/0
9/1	9/2	9/3	9/4	9/5	9/6	9/7	9/8	9/9	9/0

SET OF RODS

Evolution of Computer systems

- ❑ **Pascaline-** Pascaline is a calculating machine developed by Blaise Pascal, a French Mathematician.
- ❑ It was the first device with an ability to perform additions and subtractions on whole numbers.
- ❑ The device is made up of interlocked cog wheels which contains numbers 0 to 9 on its circumference.
- ❑ When one wheel completes its rotation the other wheel moves by one segment.
- ❑ Pascal patented this device in 1647 and produced it on mass scale and earned a handful of money.



Difference Engine

In 1822, an English mathematician “Charles Babbage” started working on a big calculating machine. The size of this calculating machine was about the size of a room. According to the bigger size of this calculating machine, Charles Babbage gave it a name of Difference Engine.

- Difference Engine gave a concept of:

{ Input ➡ Process ➡ Output }

as a foundation of latest digital computers used nowadays.

ANALYTICAL ENGINE:

- For many years, Charles Babbage worked on this machine but he couldn't complete it. Later, Charles Babbage came up with an idea of Analytical Engine. But unfortunately, he couldn't be able to complete it because at that time, the technology was not advanced enough to help him to complete it.



Hollerith Desk

In 1890, an American Inventor, “Harman Hollerith” invented a Tabulating Machine to help with the census of 1890 in America. This Tabulating machine is called “Hollerith Desk”. Tabulating Machine used a concept of Punched Cards, Card Reader, A Gear driven mechanism.

- Punched Cards used patterns related to binary digits like **1100101** (an instruction).
- **1** means that rod pass through holes,
- **0** means that rod didn't pass through the holes.
- Card reader has an ability to sense the holes in the Punched cards.
- A gear driven mechanism could count and large set of dial indicators to display the result.
- **NOTE:**
- After this invention, Hollerith Desk started a company named as “**Tabulating Machine Company**”.
- Finally, Tabulating Machine Company name was changed by a company name “**International Business Machines**”.

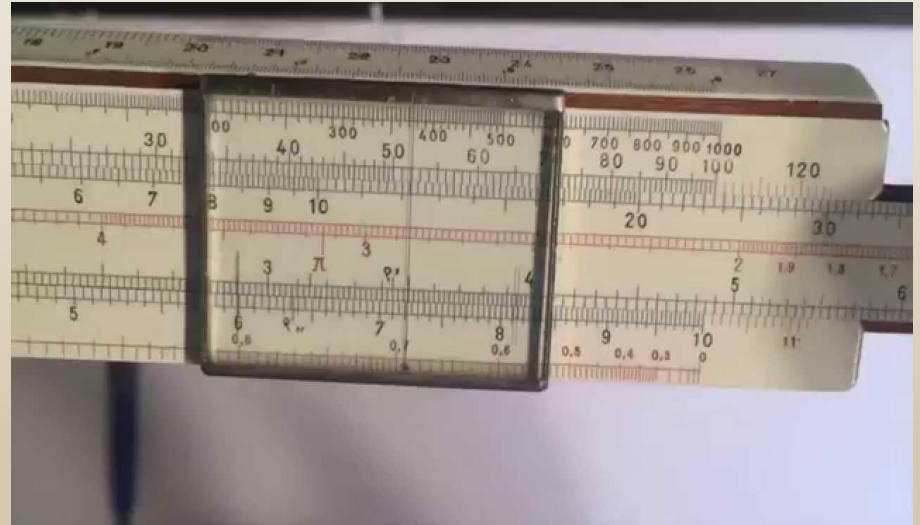


Slide Rule

- In 1920's, an English mathematician “**William Oughtred**” developed a device which is called Slide Rule (based on the idea of logarithm).

Slide Rule consists of three parts:

- **Slide**
- **Rule**
- **A transparent sliding cursor**
- An ability to solve different mathematical calculations using Multiplication and Division.



Harvard Mark-I

In 1944, an American inventor named as “HOWARD AIKEN” invented a digital computer known as Mark-I.

How Mark-I works?

- Mark-I has an ability to add three number having eight digits in one second.
- It displayed results on punched cards or an electric type writer.

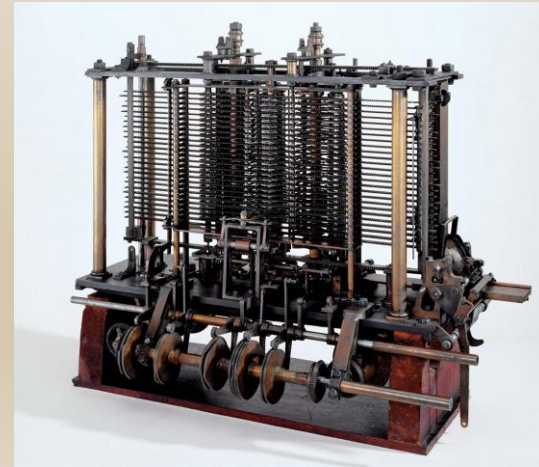
Construction:

- Mark-I was 50 feet long, 8 feet high and weight is about 5 tons.
- It used 3000 electric switches (**ON, OFF**)



Ada Lovelace

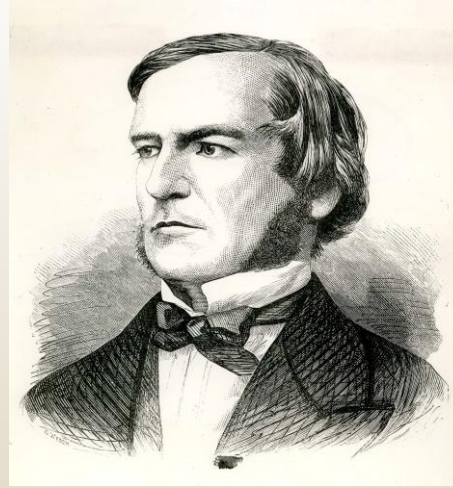
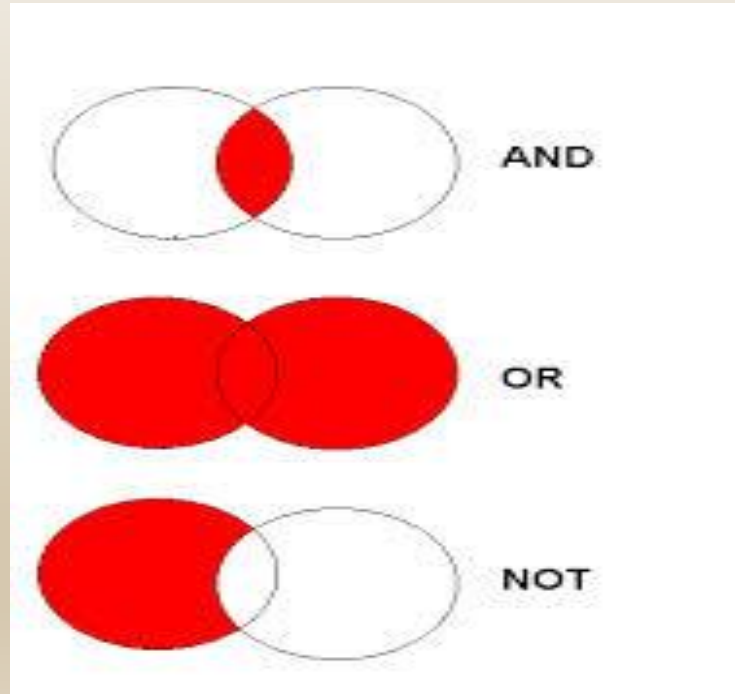
- Ada Lovelace, world's first computer programmer, provided the first algorithm intended to be processed by Charles Babbage's early mechanical general-purpose computer, the Analytical Engine.
- She suggested that a binary system should be used for storage rather than a decimal system.



Boolean Logic(1850s)

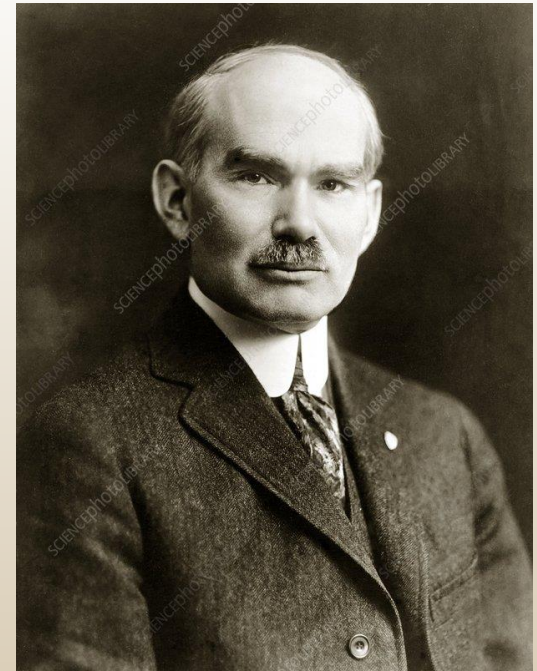
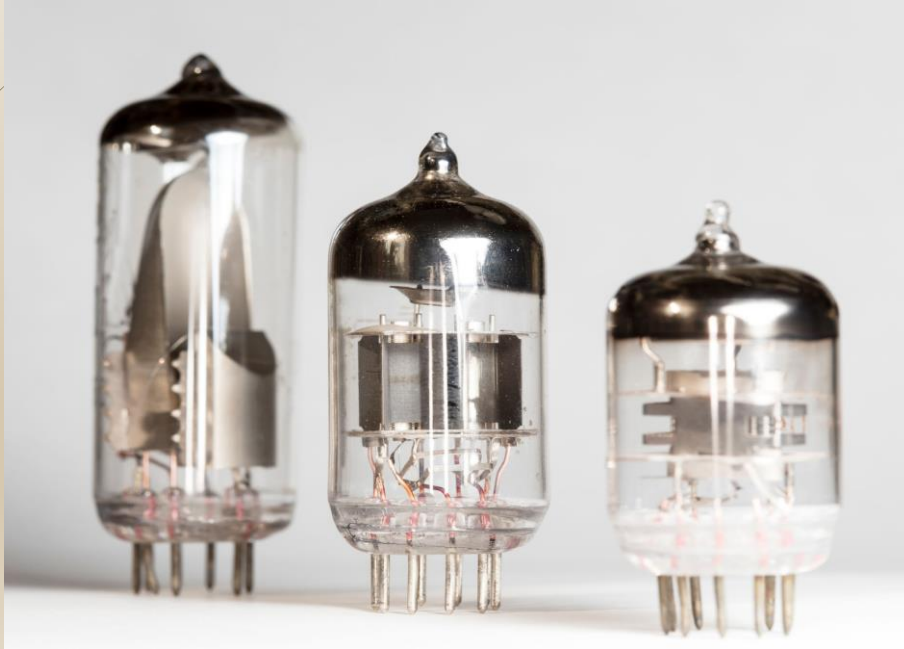
“George Boole”

developed Boolean logic which would later be used in the design of computer circuitry.

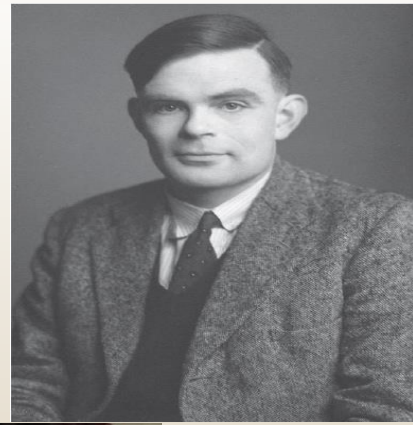


Vacuum Tube (1906)

The vacuum Tube is invented by American physicist Lee De Forest.



Turing Machine (1943)



British mathematician Alan Turing developed a hypothetical device, the Turing machine which would be designed to perform logical operation and could read and write.

