

Introduction To Computers

History Of Computers

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- Before the 1500s, in Europe, calculations were made with an **abacus**

Invented around 500BC, available in many cultures (China, Mesopotamia, Japan, Greece, Rome, etc.)



- In 1642, **Blaise Pascal** (French mathematician, physicist, philosopher) invented a mechanical calculator called the **Pascaline**

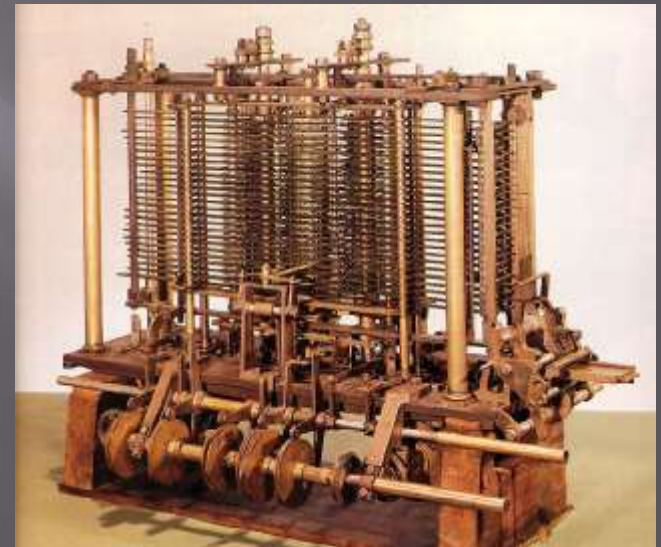
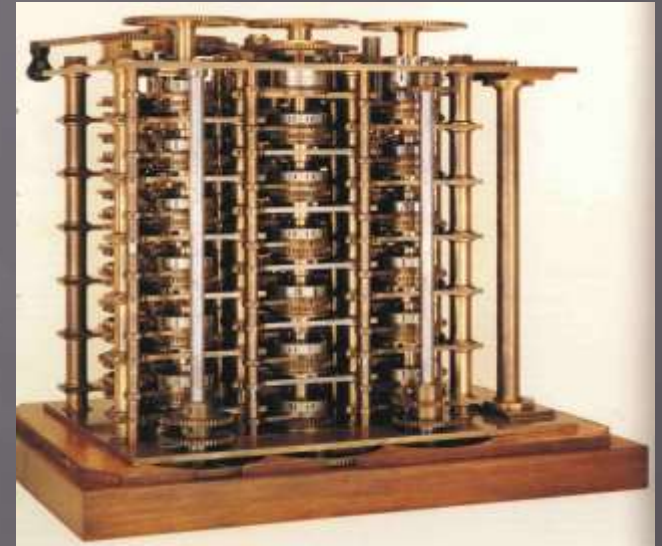


- In 1671, **Gottfried von Leibniz** (German mathematician, philosopher) extended the Pascaline to do multiplications, divisions, square roots: the **Stepped Reckoner**

None of these machines had memory, and they required human intervention at each step



- In 1822 **Charles Babbage** (English mathematician, philosopher), sometimes called the “father of computing” built the **Difference Engine**
- Machine designed to automate the computation (tabulation) of polynomial functions (which are known to be good approximations of many useful functions)
 - Based on the “method of finite difference”
 - Implements some storage
- In 1833 Babbage designed the **Analytical Engine**, but he died before he could build it
 - It was built after his death, powered by steam



Introduction To Computers

The literal meaning of **computer** is a device that can calculate. However, modern **computers** can do a lot more than calculate. **Computer** is an electronic device that receives input, stores or processes the input as per user instructions and provides output in desired format.

Generations of Computers

- First Generation (1946-59)
- Second Generation(1957-64)
- Third Generation(1965-70)
- Fourth Generation(1970-90)
- Fifth Generation(1990 till date)

First Generation Computers

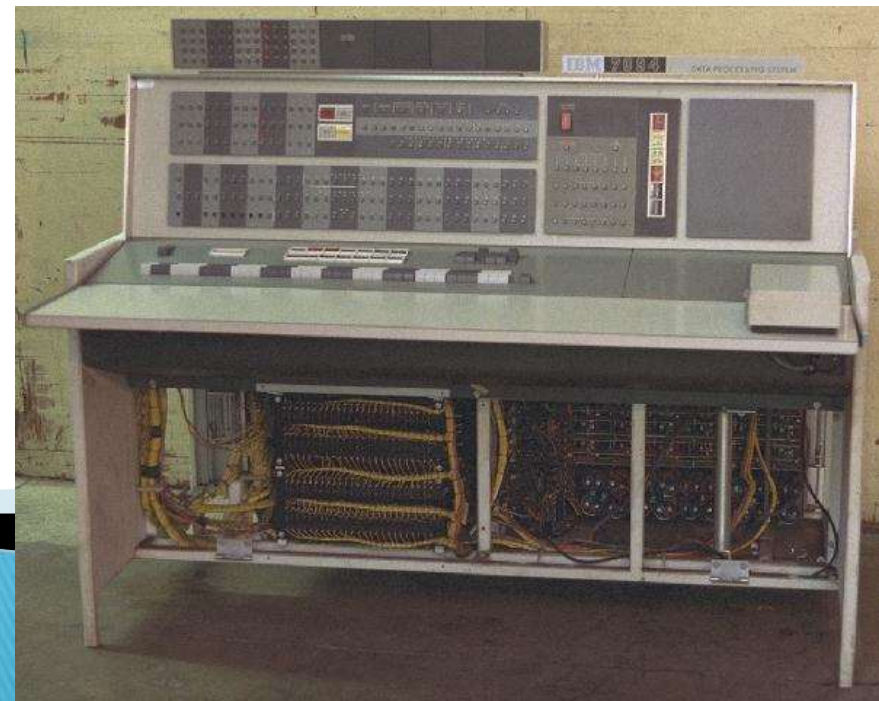
1951-1959

- Characterized by vacuum tubes which burned out very rapidly.
- ~~The first generation of computers used machine language or 0s and 1s.~~
- This generation also used magnetic tape.

THE SECOND GENERATION (1957 TO 1964)

- The second generation of computers used transistors for the internal operations.
- They used magnetic core for the memory.
- These machines used assembly language

Generation 2: IBM7094



THE THIRD GENERATION (1965 TO 1970)

- **These computers used integrated circuits on silicon chips.**
- **They were characterized with high-level programming languages which required logic such as BASIC, Pascal, C, COBOL, and Fortran**



Generation 3: Integrated Circuits



Seymour Cray created the Cray Research Corporation
Cray-1: \$8.8 million, 160 million instructions per second and 8 Mbytes of memory

THE FOURTH GENERATION (1970 TO 1990)

- **These computers use microprocessor chips.**
- **Object-Oriented Programming (OOP) Languages such as Visual Basic, and JAVA are characteristic of this computer generation.**
- **The new languages are based on a concept called Object-Oriented Programming (OOP) which encourages programmers to reuse code by maintaining libraries of code segments.**

These programs are designed to solve specific problems and require little special user training. This includes Query Languages and application generators

Generation 4: VLSI



Microprocessors

Improvements to IC technology made it possible to integrate more and more transistors in a single chip

SSI (Small Scale Integration): 10-100

MSI (Medium Scale Integration): 100-1,000

LSI (Large Scale Integration): 1,000-10,000

VLSI (Very Large Scale Integration): >10,000



A Fifth Generation? AI and Natural Languages

The term “Generation 5” is used sometimes to refer to all more or less “sci fi” future developments

Voice recognition

Artificial intelligence

Quantum computing

Bio computing

Nano technology

Learning

Natural languages

