CHAPTER 02
COMPUTER DEVELOPMENT
कम्प्यूटर का विकास

Introduction

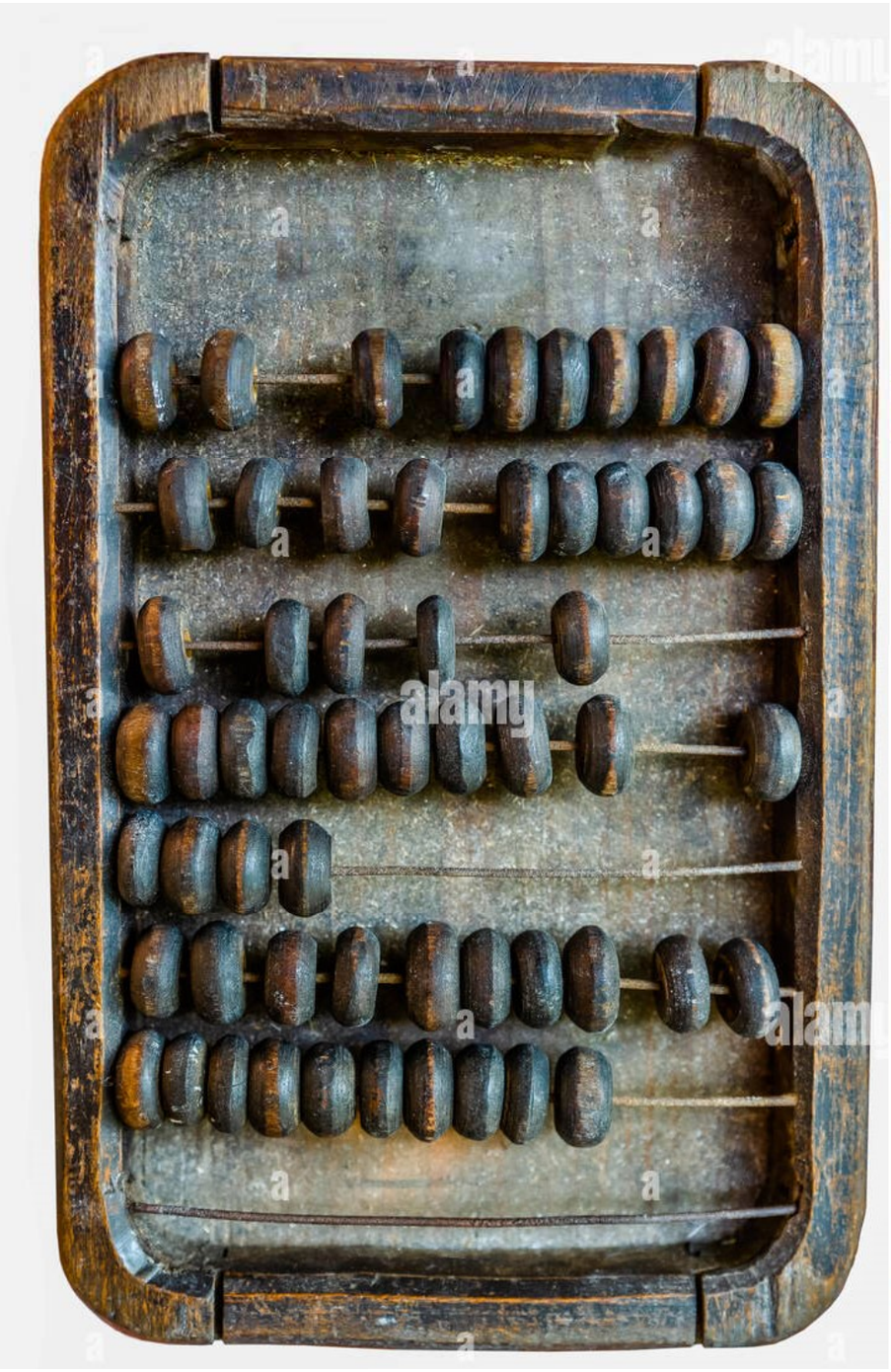
- Computer is a man-made electronic machine that changes the way we work, live and play.
- A machine that has done all this and more, now exist in nearly every business and one out of every two households .
- This incredible invention is the computer.

Introduction

HISTORY OF COMPUTERS

Introduction

- The computer is one of the most powerful innovation in human history .
- The electronic computer has been around for over a half-century, but it's Ancestor Abacus has been around for 2000 years .



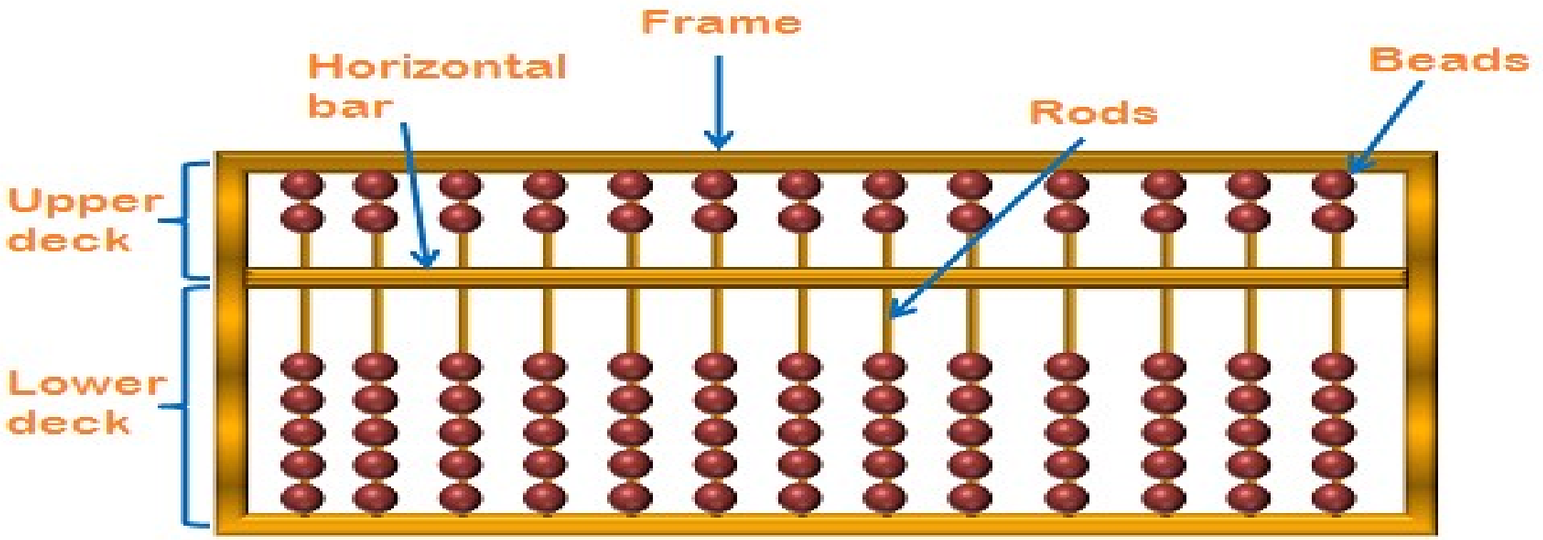
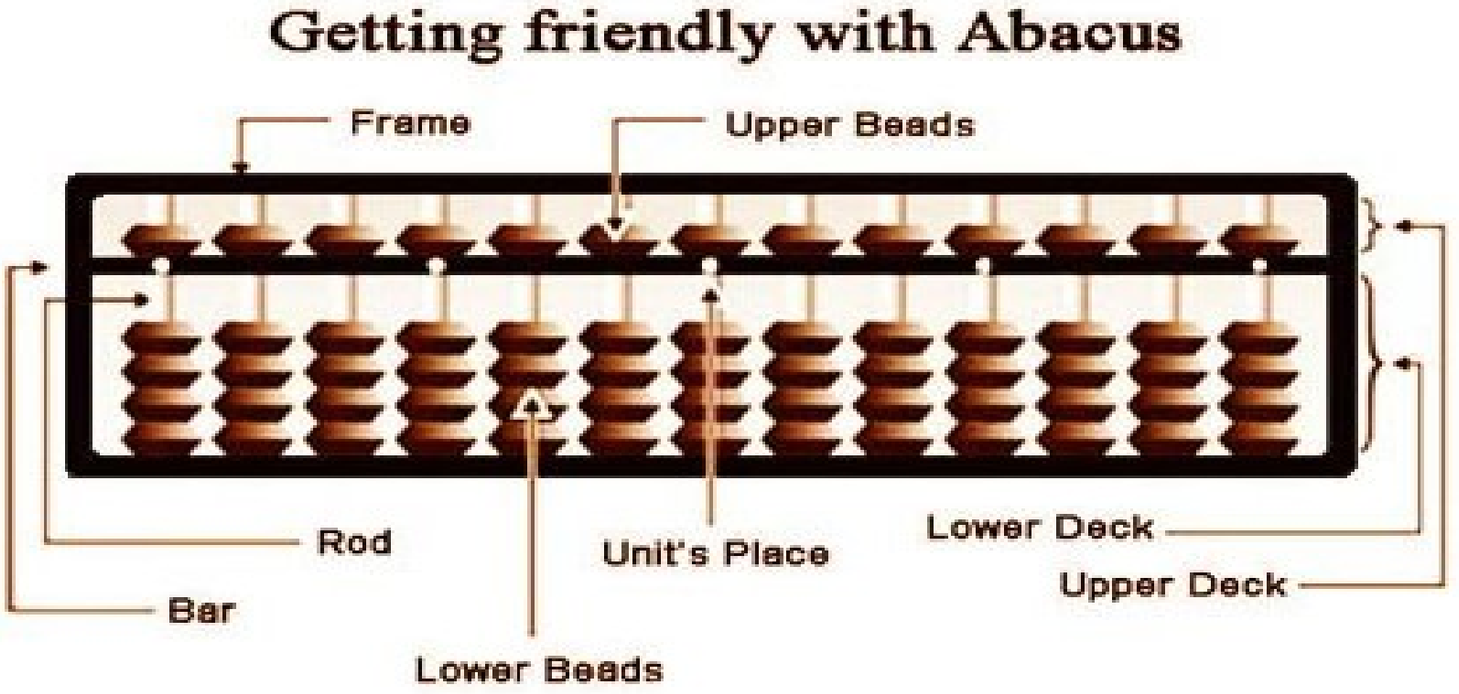


Fig: Chinese abacus



Introduction

- However, only in the last 40 years it has changed the our lifestyle.
- From the first wooden abacus to the latest high speed microprocessor, the computer has changed nearly every aspect of peoples lives for the better.
- With the use of computers, people are suddenly able to perform a large amount of computation at dazzling speed .

Introduction

- information can be crunched, organized, and displayed in the blink of an eye.
- things that were only dreams a few years ago are now possible due to computer.

1940s

1970s

1980s

HISTORY OF **COMPUTERS**

designed by vexels

1990s

2010s

2020s

Evolution of computer

- **1-Abacus:** the abacus is one of the earliest known computation devices.
- it is a tool that help in calculating answer of arithmetic problems.

Evolution of computer

- it is simply a wooden rack holding parallel wires on which beads are strung.
- Calculations are done by manipulation in the beats.

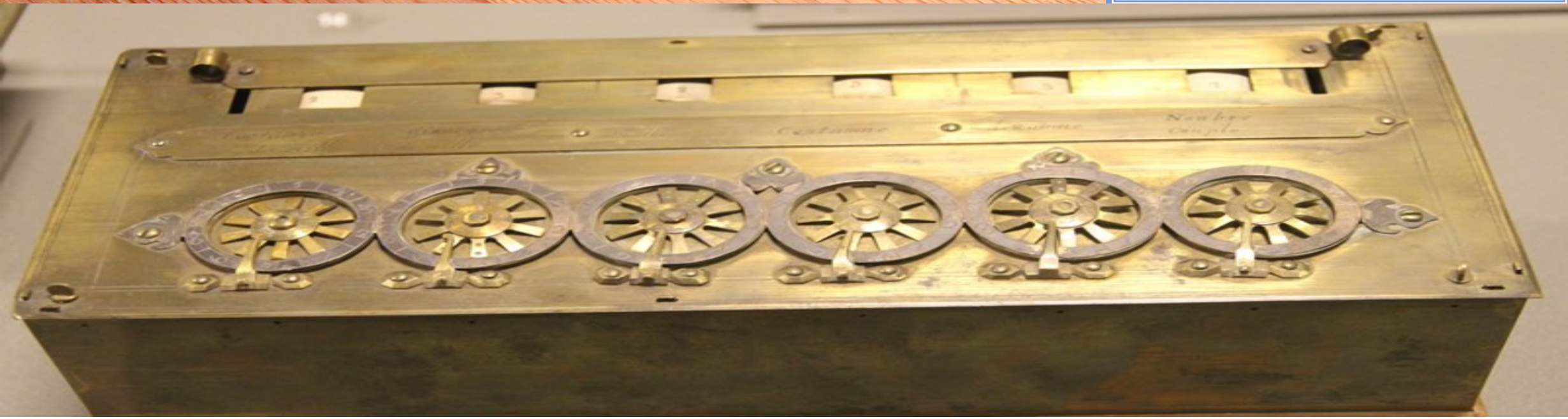
Evolution of computer

- The abacus was developed in China about 5000 years ago.
- The abacus was so successful that is use spread form China to many other countries .

Evolution of computer

- **2 . Pascal calculator :** the first real mechanical calculator was invented by a French scientist and mathematician Blaise Pascal around 1645.
- The device was constituted by interlocking gears representing the number 0 to 9.
- It was only able to do addition and subscription so it is called adding machine.

Blaise Pascal



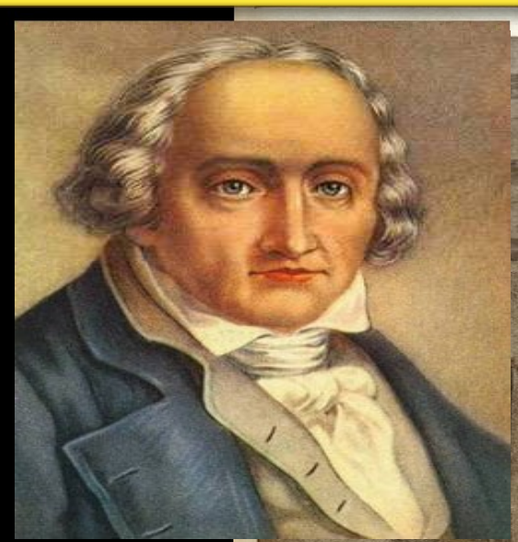

2
3
2
3
3
1
Centaines de mille
Dizaines de mille
Mille
Centaines
Dizaines
Nombre simple

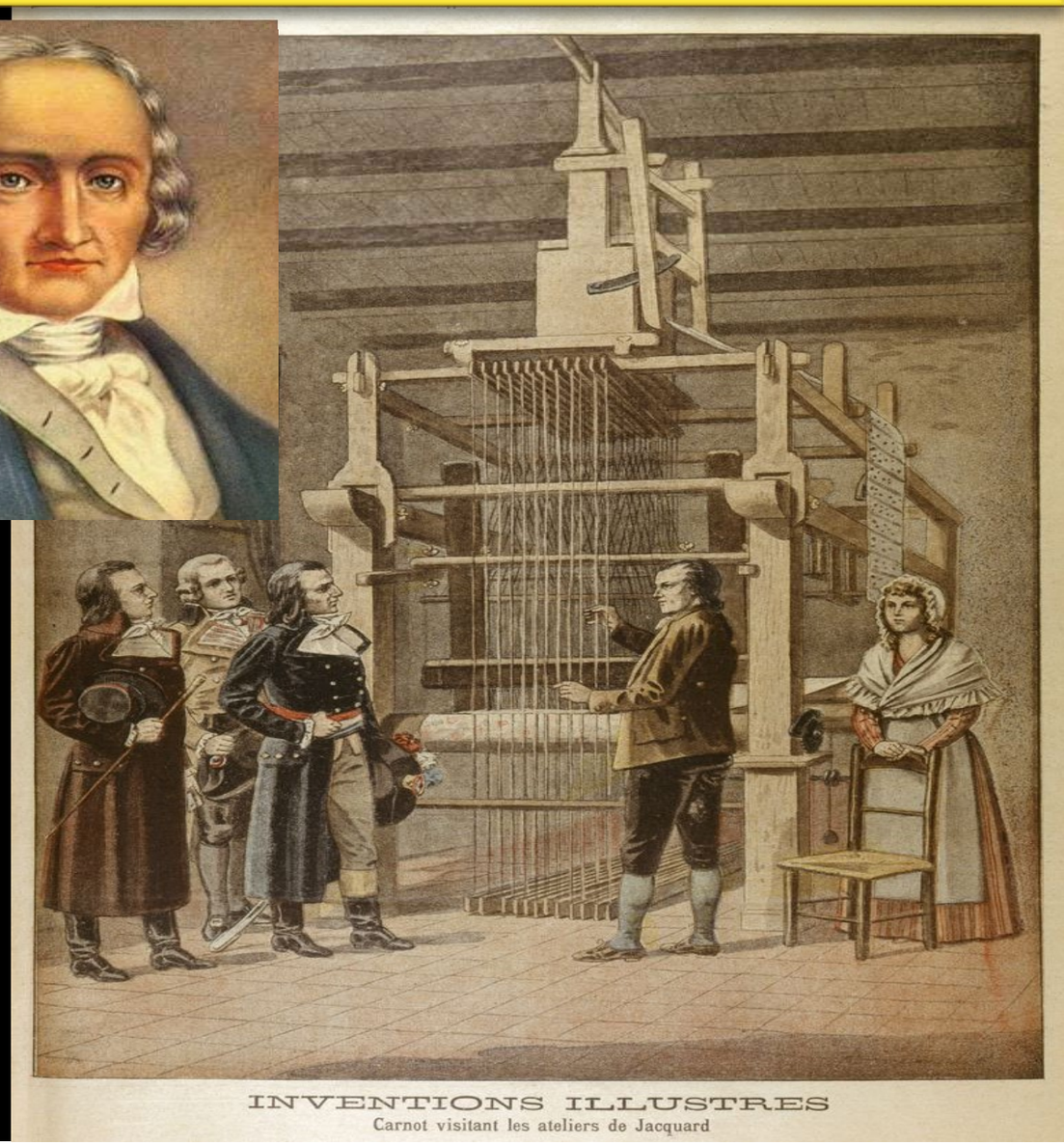
Evolution of computer

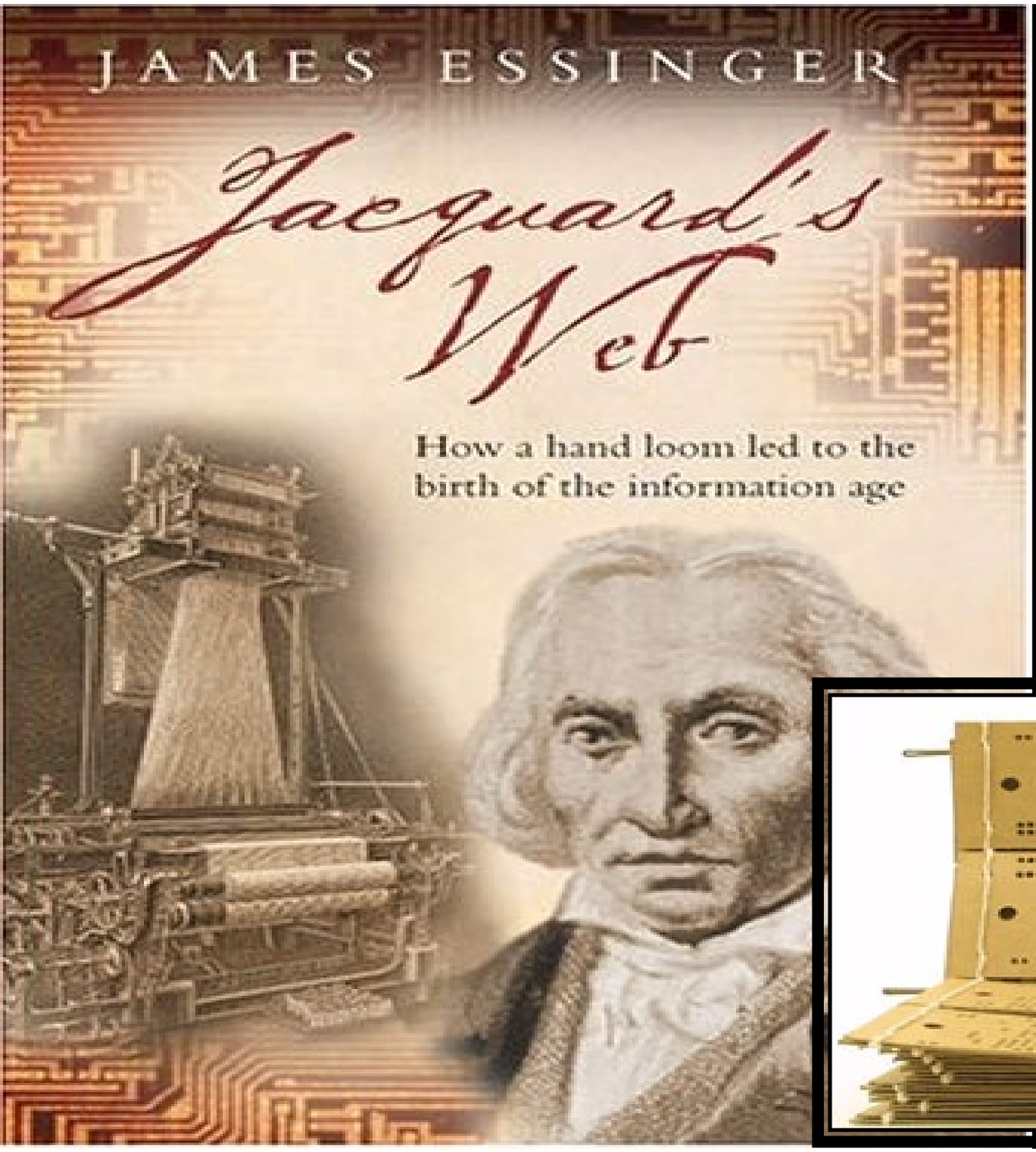
- **3. Analytical Engine :** in 1801, Joseph Marie jacquard perfected the idea of the automated weaving loom.
- Using holes punched into a series of connected cards, Jacquard was able to control the weaving of fabrics.

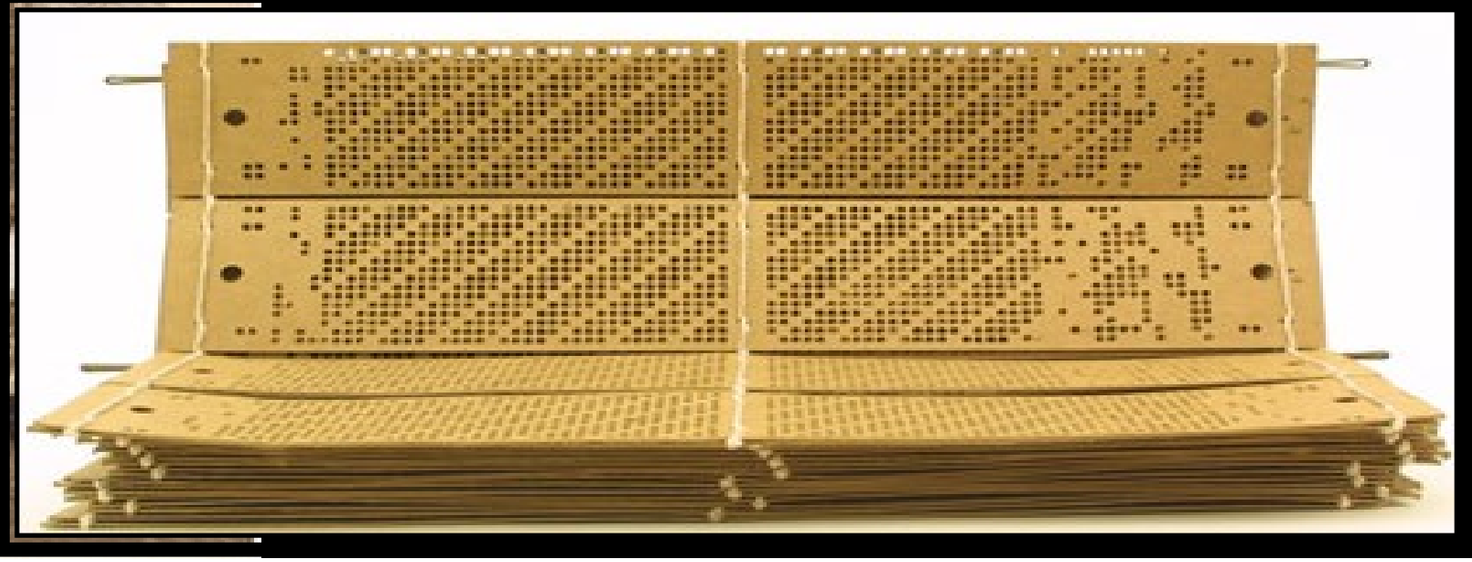
एनालिटिकल इंजन(Analytical Engine)

- सन् 1801 में जोसफ मेरी जैक्वार्ड ने स्वचालित बुनाई मशीन **(Automated weaving loom)** का निर्माण किया।
- इसमें धातु के प्लेट को छेदकर पंच किया गया था और जो कपड़े की बुनाई को नियंत्रित करने में सक्षम था।



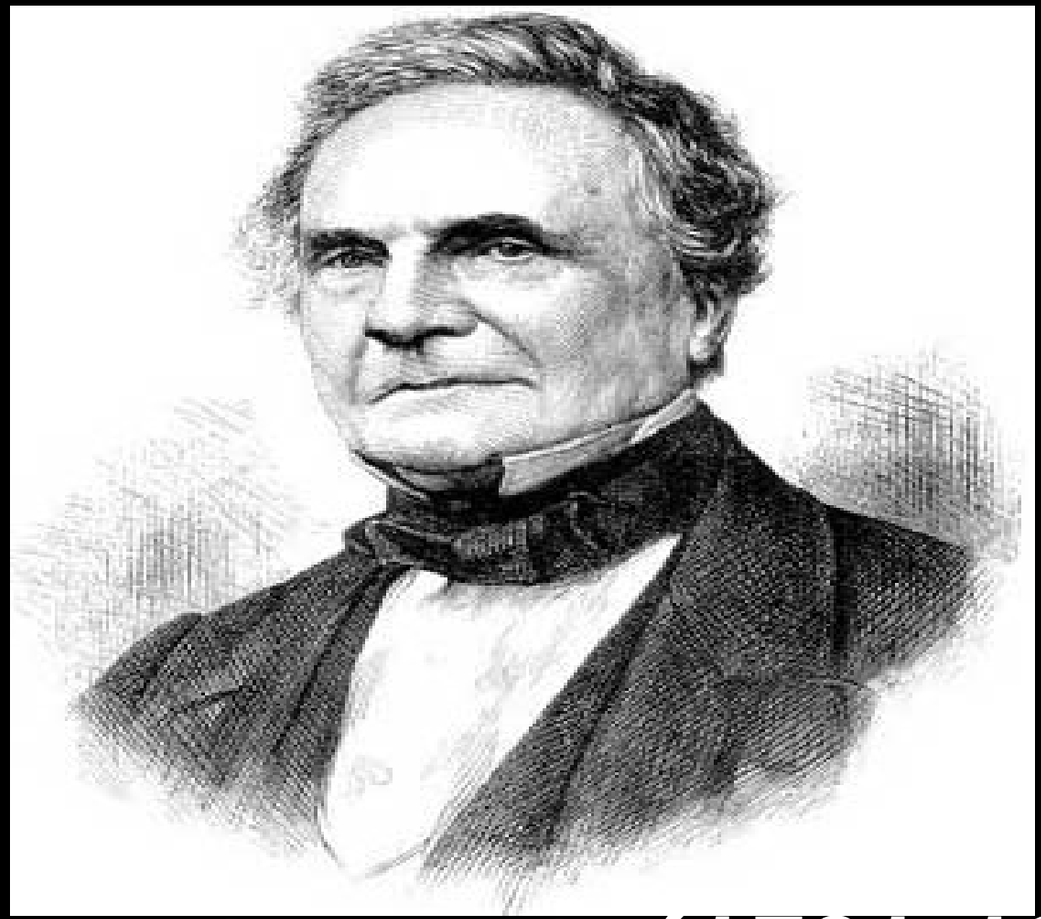



JAMES ESSINGER
Jacquard's Web
How a hand loom led to the birth of the information age



Evolution of computer

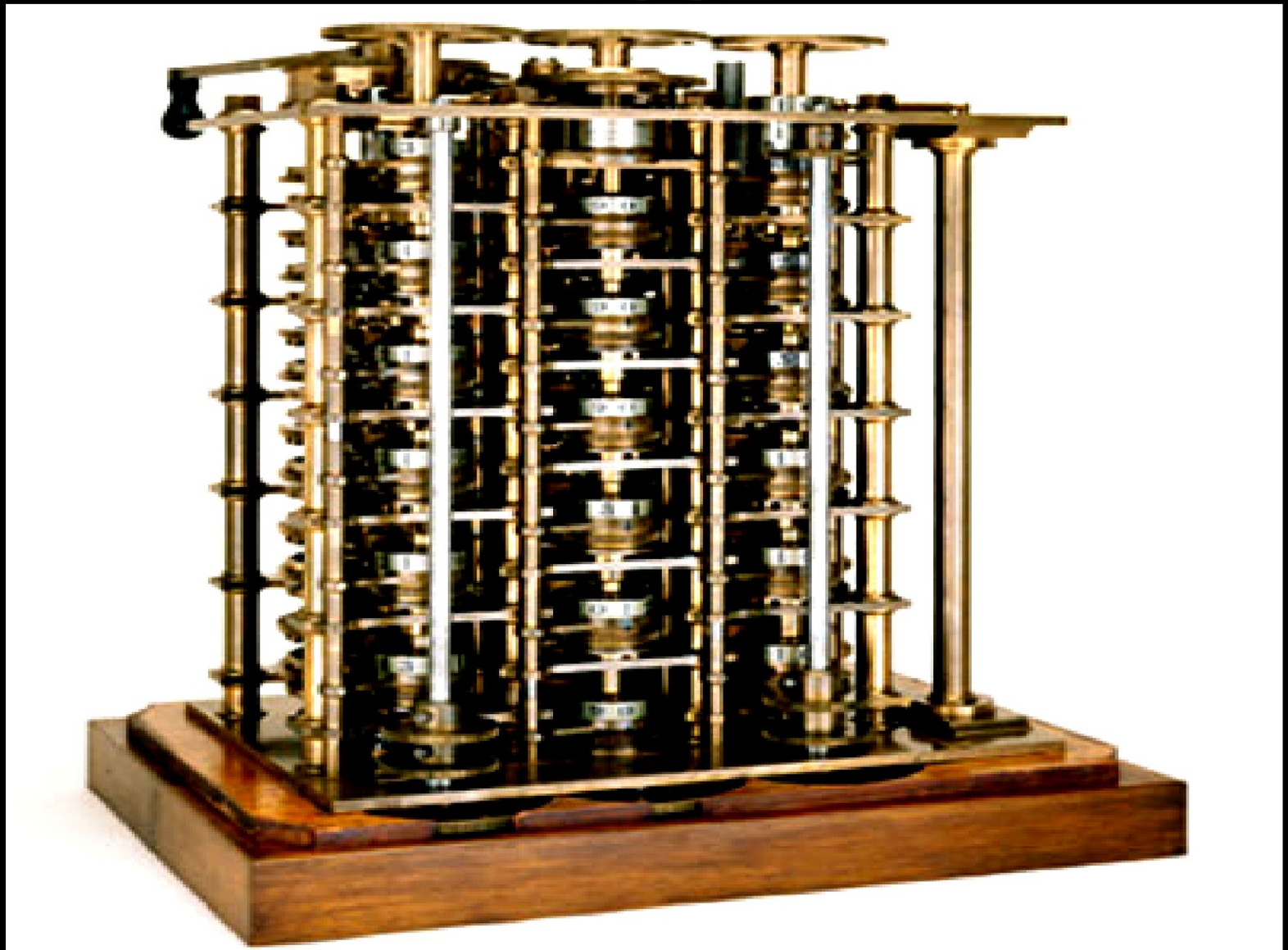
- The Jacquard loom not only cut back on the amount of human labour, but also allowed for patterns to be storage now on cards and to be utilized over and over again to achieve the same product.
- In 1820 Charles Babbage, a British mathematician and inventor, designed and bolt the Mechanical calculator and the difference engine or principals that anticipated the modern electronic computer.
- The concept beverage but forwards was eventually used by engineer's in the development of the first computer prototype.



CHARLES BABBAGE (1791-1873)

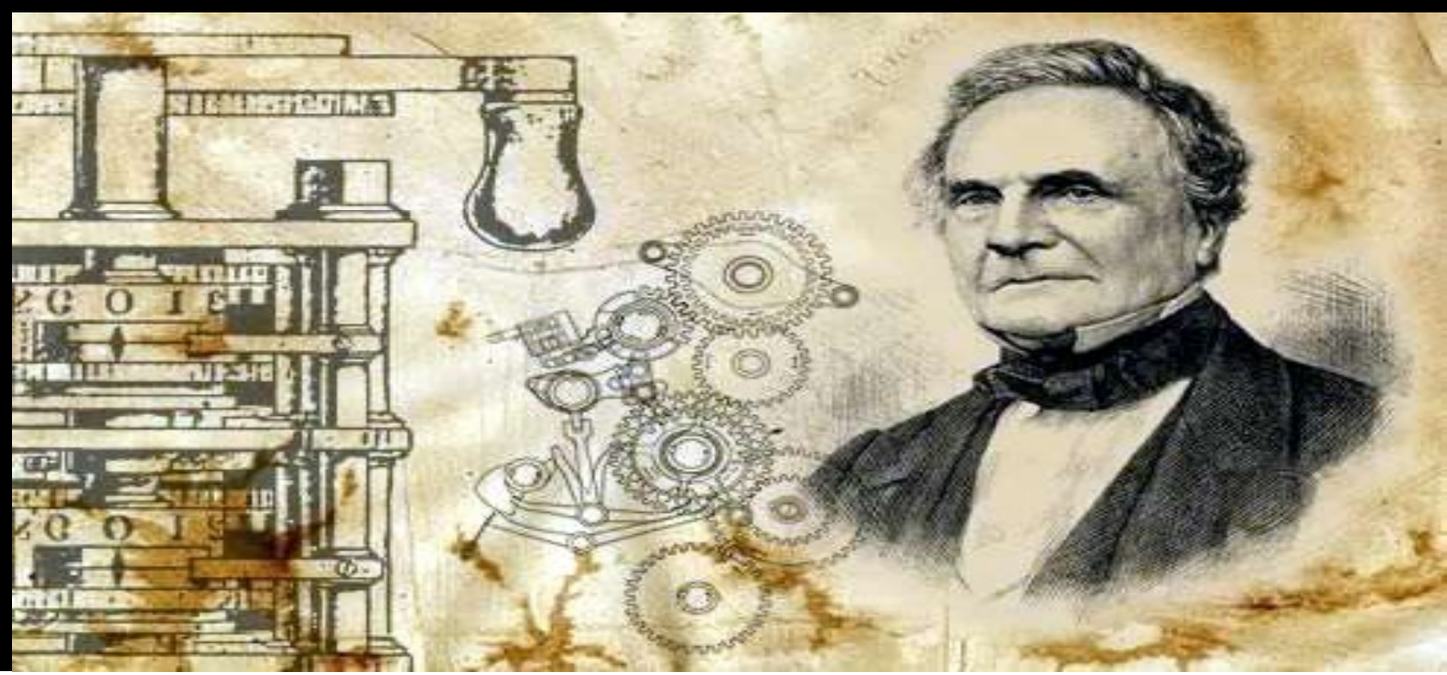
FATHER OF COMPUTERS

CHARLES BABBAGE ENGINE
1832

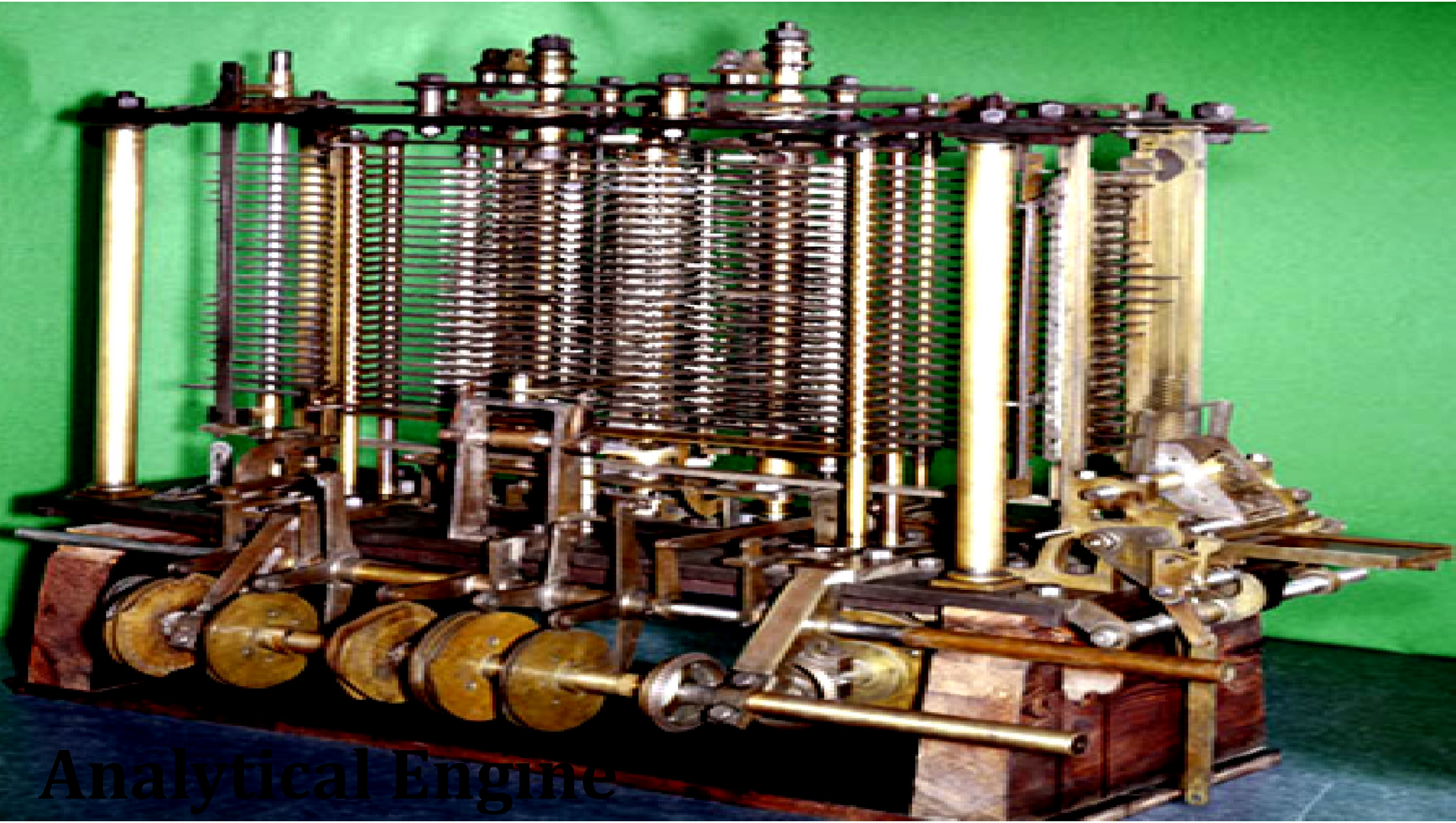


चार्ल्स बैबेज (Charles Babbage)

- सन् 1820 में एक अंग्रेज आविष्कारक चार्ल्स बैबेज **(Charles Babbage)** ने पहले डिफरेंस इंजन **(Deference Engine)** तथा बाद में एनालिटिकल इंजन बनाया।
- चार्ल्स बैबेज के कॉन्सेप्ट का उपयोग कर पहला कम्प्यूटर प्रोटोटाइप का निर्माण किया गया।
- इस कारण चार्ल्स बैबेज को 'कम्प्यूटर का जन्मदाता' **(Father of Computer)** कहा जाता है।



Deference Engine


Analytical Engine

- दस साल की मेहनत का बावजूद वे पूर्णतः सफल नही हुए।
- सन् 1842 में लेडी लवलेश **(Lady Lavelace)** ने एक पेपर **L.F. Menabrea on the Analytical Engine** का इटालियन से अंग्रेजी में रूपान्तरण किया।
- आगॅस्टा ने ही एक पहला **Demonstration Program** लिखा और उनके बाइनरी अर्थमेटिक के योगदान को जॉन वॉन न्यूमैन ने आधुनिक कम्प्यूटर के विकास के लिए उपयोग किया इसलिए आगॅस्टा को 'प्रथम प्रोग्रामर' तथा 'बाइनरी प्रणाली का आविष्कारक' कहा जाता है।

Evolution of computer

- For this reason Charles Babbage is known as father of computing.
- Despite 10 years of work, Babbage failed to build a fully operational model of difference or an analytical engine.

Evolution of computer

- in 1842 Lady Lovelace wrote are demonstration program and her contribution to binary arithmetic was later used by John von Neumann in developing the modern computer.
- So she is often regarded as the “first computer programmer”.

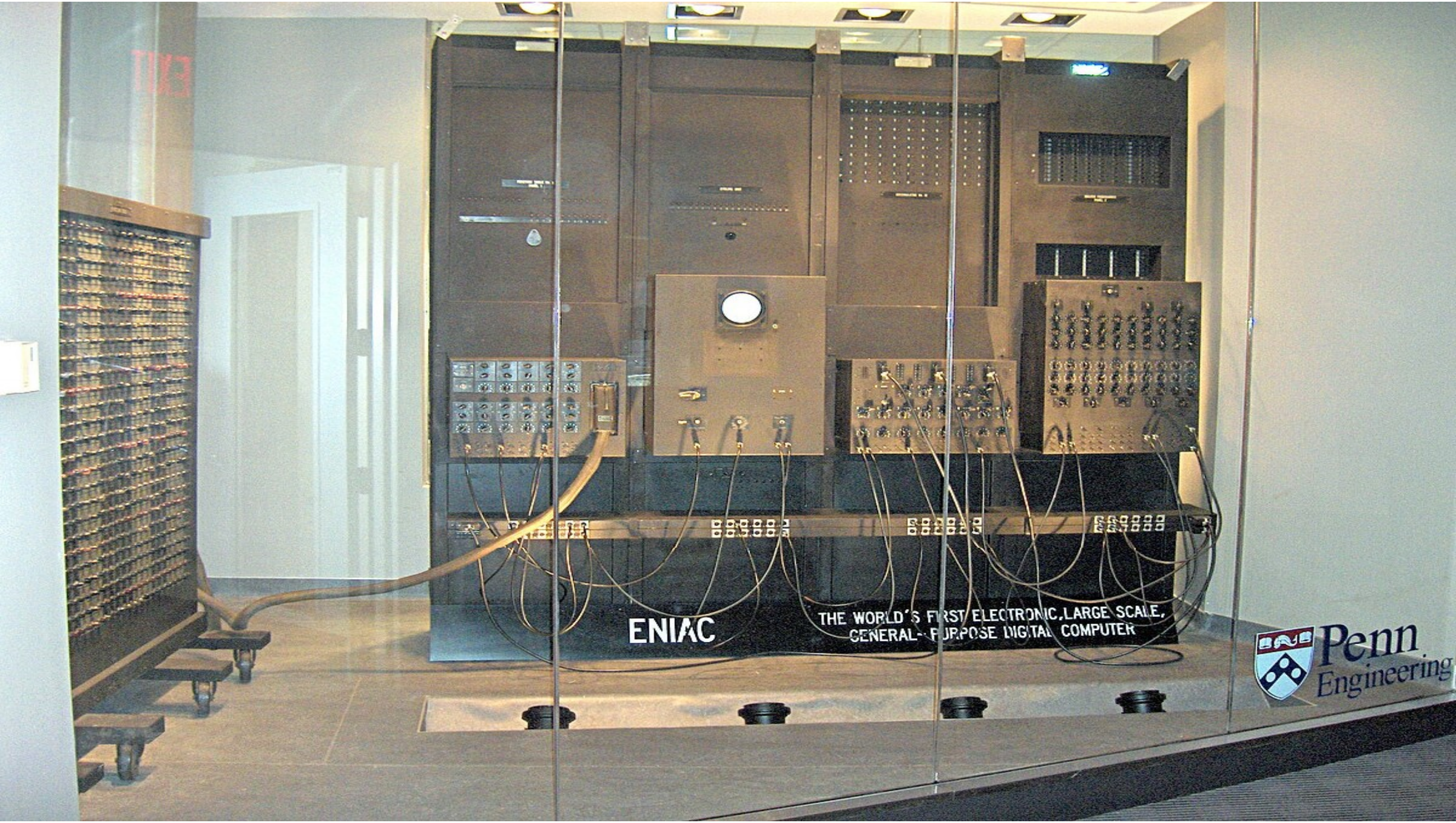
Evolution of computer

- **4. Herman Hollerith and Punch Cards :** In 1890 the United States Census bureau asked Herman Hollerith to find a way to speed up the processing a census data.
- Herman Hollerith created puncture cards the resembles today's computer cards.
- He also invented the Hollerith 80 columns code and tabulating machine.


CRAIG BALL 3251 LAUREL STREET NEW ORLEANS LOUISIANA 70115 USA
CDB 2019

Evolution of computer

- **5. First Electronic Computer (ENIAC) :** Howard Aiken, with his colleagues at Harvard and with some assistance from International Business Machines he had built by 1942 the marks I, the word's first program controlled calculator and early from of a digital computer.
- In 1944 John Mauchley, an American physicist, and J. Prosper Eckert, a great and American engineer proposed and electronic digital computer, called the Electronic Nominal Integrated And Computer (ENIAC), and completed it in 1946 which is regarded as the first successful general digital computer.


ENIAC
THE WORLD'S FIRST ELECTRONIC, LARGE SCALE,
GENERAL-PURPOSE DIGITAL COMPUTER
Penn
Engineering

Evolution of computer

- **6. Stored Program Concept (EDSAC) :** According to John Von Neumann's concept, the operating introspection and data used in processing should be stored inside the computer.
- Whenever is easy the computer would have the capability to modify these program instructions, during their execution.

Evolution of computer

- This concept was incorporated into the EDSAC computer (Electronic Delay Storage Automatic Computer), which was developed at Cambridge University.
- This computer was cable of a storing a skills of intersection, the equivalent of the first computer program.

Evolution of computer

- **(UNIVAC) 1 :** it is the short form of Universal Automatic Computer.
- In 1951 it was introduce and become the first commercially available computer.
- The (UNIVAC) 1 was characteristic of the first generation of computer.


UNIVAC
UNIVAC 1

Development	Approximate Dates	Important Features
Abacus	2000-3000 BC	First mechanical computer
Pascal's Calculator	1645	First adding machine capable of counting, adding and subtracting
Jacquard’s weaving loom	1801	Utilized metal plate with Punched holes to control waving patterns
Babbage Analytical Engine	1834-1871	Intended to be the first generation propose computer the engine was never constructed in Babbage's lifetime
Herman tabulating machine	1887-1896	designed a cord and decide to punch data into card and tabulate collected data using automating the census of 1980
Howard Aiken Mark I	1937-1944	the largest electromechanical computer ever built utilized punch paper type to store data

Development	Approximate Dates	Important Features
ENIAC	1943-1950	first electronic computing devices in which program wired into a permanent penal a no significant storage capability
John Von Neumann's stored program concept	1945-1952	developed the concept of storing program instructions and data in the memory of memory of the computer credited with introducing the idea of coding data and instructions of binary
EDSAC	1946 – 1952	first computer capable of storing instructions and data in memory
UNIVAC I	1951-1954	First computer that was commercially available and produced in quantity

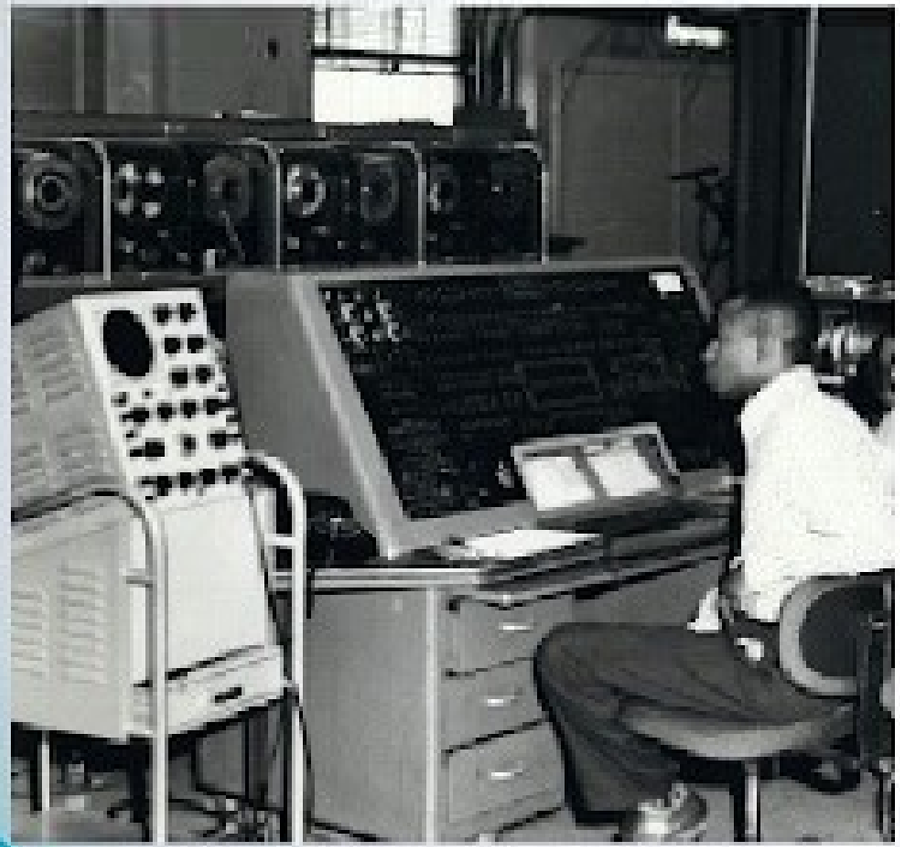
Computer Generation

- The history of the development of computer is often referred to in tracing the different generations of computing device.
- Each generation of computer is characterized buy a major technology development that one day mental change the way computer operate resulting in increasingly smaller cheaper more powerful and effects and reliable device.

First generation (1942-1955)

- the first generation computers were entirely electronic.
- they used vacuum tubes to store instructions magnetic drums were used for memory.
- They were often in Roman taking up entire rooms.
- They were very expensive to operate and in addition to using a great deal of electricity a lot of heat which of the needed expensive air conditioning.
- First generation computer realised on machine language (1s and 0s) the lowest level programming language understood by computers to perform operation and they could solve only one problem at a time.

First Generation Computer



Time: 1940 - 1956

First generation (1942-1955)

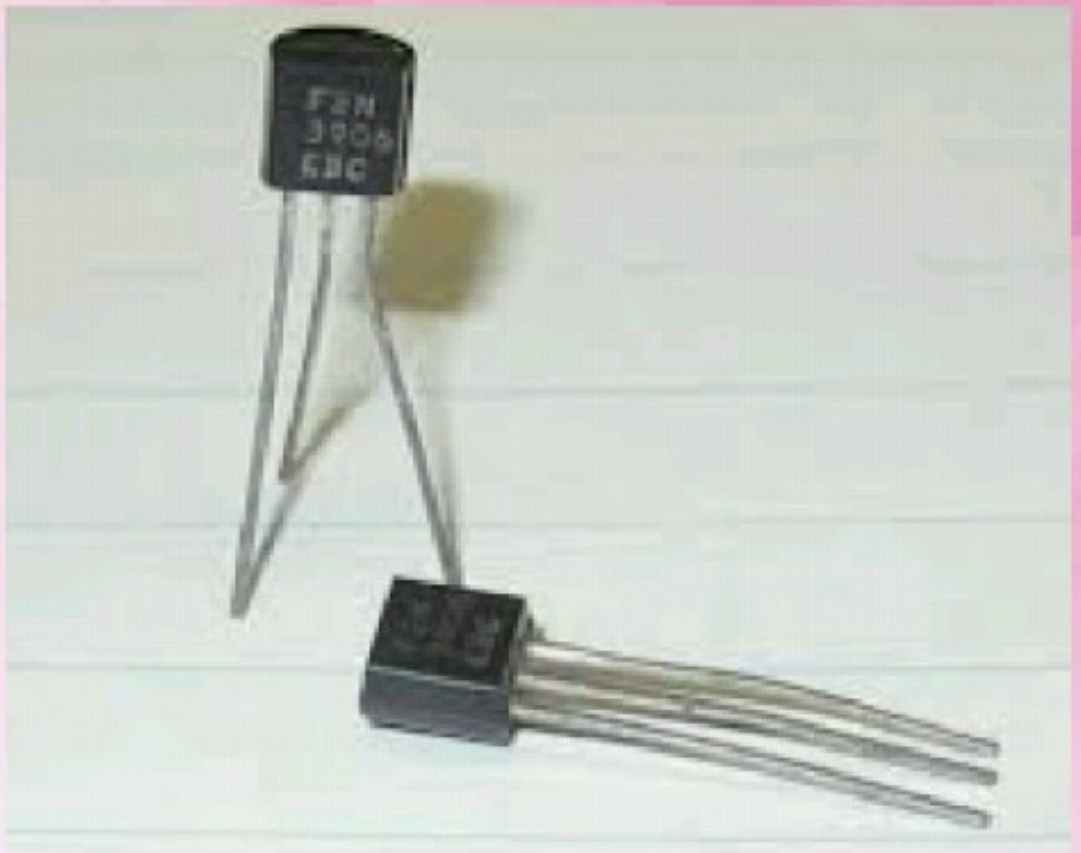
- The UNIVAC 1,ENILAC and mark 1 computers are examples of the first generation computing device the UNIVAC was the first commercial but it was dedicated to a business client the US census bureau in 1951.


UNIVAC
Reserve Key
UNIVAC II

Second generation (1955-1964)

- In second generation of computer solid state register replaced vacuum tube in computer.
- It was invented in Bell laboratories.
- The transistor was far superior than the vacuum tube, allowing computers to become smaller, faster, cheaper, more-energy efficient and more reliable.
- To represent data a magnetic core is used in computer.
- At about the same time magnetic tape and disk begin to be used as an auxiliary storage.

Second Generation Computer



Time: 1956 - 1963

Second generation (1955-1964)

- Magnetic disc was layered by iron oxide.
- Magnetic disc made possible Direct access of Data.
- As a result of these developments, significant increase in the speed processing capability of computer was achieved.
- Businessman begin to use computers increasing numbers and new high level programming language also develop at this time, such as early versions of COBOL and FORTRAN.

Third generation (1965-1974)

- Further development in electronics drought further Reduction in size, greater reliability, speed and lower costs computer.
- Integrated circuits (IC) replaced the transistors, which was developed by J.S. Kilbi.
- There was the hallmark of the third generation of computers.

Third Generation Computer

Time: 1964 - 1971

Third generation (1965-1974)

- Please development is known as LSI (large scale integration) and refers to the ability of compress large number of integrated circuits on a single silicon chip.
- There is also VLSI (Very Large Scale Integration)

Third generation (1965-1974)

- Another development that changed the way people use computers was time sharing.
- A time shared computer allows many users, each working at a separate input/output terminal, to use it at the same time.

Third generation (1965-1974)

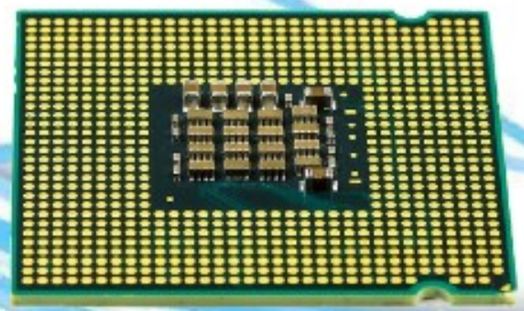
- User interacted third generation computer through keyboard and monitor and interfaced but an operating system, which allowed the device to run many different applications at one time with a central program that monitored the memory.
- Computer for the first time because accessible to Mass users because they bear smaller and cheaper than their predecessors.
- Users could use software according to their need because software and hardware where available separately.

Fourth generation (1975 up till now)

- Fourth generation computer continued to be characterized buy chips that can contain increasing numbers of items.
- This further miniaturization of components referred to as ULSI ultra large scale integration resulted in increased speed greater reliability and enormous storage capacities for current computers

Forth Generation Computer

Time: 1976 - 1999



Microprocessor

Fourth generation (1975 up till now)

- By using LSI technology microprocessor was produced.
- This microprocessor brought the fourth generation of computers has thousands of integrated circuits where built into a single silicon chip.
- Computer of the first generation that field and entire rooms would know fit in the following of the hand.
- The Intel 4004 develop in 1971 located all the components of the computer from the CPU and memory to input output controls on a single chip.

Fourth generation (1975 up till now)

- In 1981 IBM introduced it's first computer for the home user and in 1984 Apple introduced the Macintosh.
- Microprocessor also moved out of the realm of desktop computers and into many areas of life.
- Everyday product such as vehicles microwave oven and electronic games etc.
- Begin to use microprocessor more and more

Fourth generation (1975 up till now)

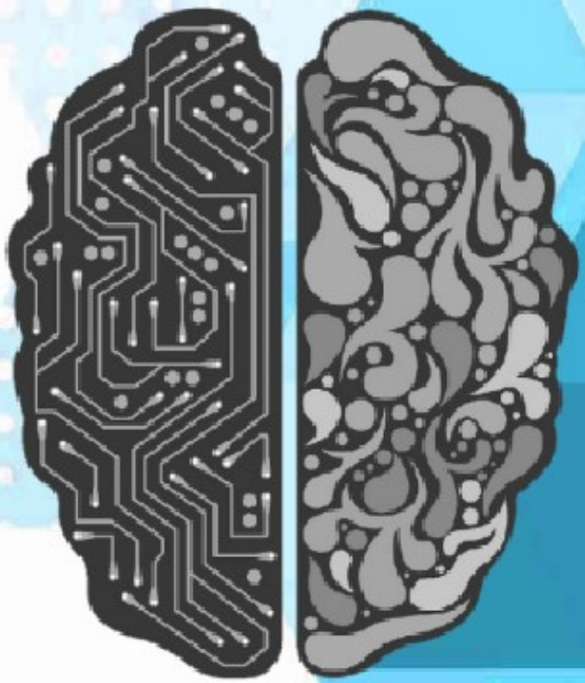
- Healthy is small computers become more powerful they could be linked together to form a network which eventually let to the development of the internet.
- 4th generation computers also say the development of GUIIs the mouse and hand hold devices.

Fifth generation (present and beyond)

- I like all other generation computers present generation of computer in characterized by the use of the technique used to reduce complex programming.
- This technique is known as artificial intelligence (AI).
- Fifth generation computer device based on artificial intelligence or still development thought there are some application such has voice recognition better being used today

Fifth Generation Computer

Time: 2000 - future



Generations	Characteristics
First Generation	1. use of vacuum tubes in circuits 2. 2 use of magnetic drum as primary internal storage medium 3. limited man storage capacity 4. slow input – output 5. low- level symbolic language programming 6. hat and maintenance problem Application : payroll processing and record keeping Example : ENIAC, IBM 650, UNIVAC 1

Generations	Characteristics
Second Generation	1. use of transistors at the place of vacuum tubes 2. use of magnetic as primary internal storage medium is dressed when storage medium 3. increased storage capacity 4. faster and input / output 5. great reduction in size and hat generation 6. Increased speed and reliability 7. High level programming language (COBOL and FORTRAN) Applications : Batch oriented (billing, payroll processing and updating inventory files) Example : IBM 1401, Honeywell 200, CDC 1604.

Generations	Characteristics
Third Generation	1. use of IC (integrated circuit) 2. use of magnetic primary storage medium 3. more flexible input / output 4. smaller size better performance and reliability 5. increased speed and better performance 6. extensive use of high level programming 7. emergence of mini computers remote processing and time sharing through communication 8. availability of operating system software to control input / output Applications : airline reservation system market fore casting and credit card billing Example : IBM system/360, NCR 395, Burroughs B6 500

Generations	Characteristics
Fourth Generation	1. use of large scale circuit 2. increased storage capacity and speed 3. modular design and compatibility between hardware provided by different manufacturers. 4. Greater versatility of input/output devices. 5. Introduction of microprocessors and micro computers. 6. Increased use of microcomputers. Applications : Electronic fund transfer, computer-aided instruction, Home computers and mathematical modeling and simulation. Example : IBM PC-XT(microcomputer), Apple II, Honeywell 6080 series.

Classification of computer by the purpose which they design

- Special purpose computers : The special purpose computers are used to solve a single and dedicated type of problem.
- for their Specialized use they are extremely efficient and economical.
- example automatic aircraft landing computerized traffic control systems.

Classification of computer by the purpose which they design

- General purpose computers : The general purpose computers are flexible and versatile.
- They can be used to solve a variety of problems by changing the program or instructions.
- Example – accounting, simulation and forecasting.

General purpose computers

Classification of computer by the types of data which they are capable of manipulating

- Digital computer : In digital computers data are represented as discrete units or electrical pulse, which can be counted and switched.
- In modern digital computer binary system is used.


IBM
064 KB_
IBM

Classification of computer by the types of data which they are capable of manipulating

- Digital clock is its good example.
- Due to fast speed and large storage capacity digital computer are used for business and scientific data processing.

Classification of computer by the types of data which they are capable of manipulating

- Analog computer : in analog computer data represented as physical quantity.
- Physical quantities are based measured in a continuous fashion and thus are ideally suited for analog computation.
- Analog computer is a machine that work on data which is always changeable.

EXAMPLES OF ANALOG COMPUTER

Classification of computer by the types of data which they are capable of manipulating

- Analog form of electricity is used by us.
- Speed of this kind of computers are so slow.
- Voltmeter, thermometer and barometer are the examples of analog device.
- analog computer are most often name before scientific and engineering purposes.

Classification of computer by the types of data which they are capable of manipulating

- Hybrid computer : Hybrid computers have completed features of both digital and analog computers with the input and output in analogue form and the processing in digital form.
- This involves analog to digital converter at the input end and digital to analog converter eat the output end.

Classification of computers on the basis of price size and capabilities

- **Supercomputer :** Supercomputers are the most powerful computer as of now.
- These computers are large in size and memory compared to all other computers.
- The work with multi processing and parallel processing facilities.
- At Present, specially in computing speed, these are very fast.
- So, this are the fastest, biggest and most expensive computers.
- These machines are special high capacity computer used by very large organization.


IBM
Blue Gene/P

Classification of computers on the basis of price size and capabilities

- The content thousands of microprocessors.
- First supercomputer of world was CRAY 1 which was developed by cray research company in 1976.
- First supercomputer of India was PARAM which was developed by C-DAC in 1991.
- It was designed for ultra high performance task such as creating animation, weather forecasting, nuclear energy research, instruction cracking and designing.
- Examples are CRY-1 and IBM’s Deep Blue.

Classification of computers on the basis of price size and capabilities

- Mainframe Computer

Classification of computers on the basis of price size and capabilities

- Mini-Computer

Classification of computers on the basis of price size and capabilities

- Micro-Computer :

Classification of computers on the basis of price size and capabilities

- **Personal Computer :** A small relatively in expensive computer design for an individual user.
- It is best on the microprocessor technology that nipples manufacture to put an entire CPU on one chip.

Classification of computers on the basis of price size and capabilities

- Business used personal computers for word processing accounting desktop permission and for spreadsheet and database management application.
- At home the most popular use of personal computer is for playing games email chatting etc.
- Examples are Apple II IBM PC Lenovo and HP etc.

Classification of computers on the basis of price size and capabilities

- **Laptop :** laptop is a personal computer designed for mobile.
- It is small enough to sit set on one slap and to a briefcase.
- Integrates most of the component of a desktop computer including a monitor a keyboard appointing device also known as as a trackpad speakers and other drives.

Classification of computers on the basis of price size and capabilities

- It includes which are jubilee rechargeable battery so it works and where.
- By using Bluetooth and Wi-Fi we can access the internet.

Classification of computers on the basis of price size and capabilities

- **Notebook computer :** An extremely lightweight personal computer and smaller than laptop.
- **Work stations :** Work stations are special single user computer having the same features as personal computer but have the processing speed equivalent computer or main frame computer.

Classification of computers on the basis of price size and capabilities

- A workstation computer can be fitted on a desktop.
- Scientist, engineer, architects and graphic designers mostly use these computers.
- workstation computer are powerful and expensive computers.

Classification of computers on the basis of price size and capabilities

- These are advanced processor more RAM and storage capacity then personal computer.
- They are usually used as single user applications but are used as servers on computer networks and web servers as well.

Classification of computers on the basis of price size and capabilities

- Palmtop : A small computer that literally in our palm.
- Compared to full size computer but they are practical for curtain function such as phone books and calendars.
- Palmtops that use and fan rather than keyboard for input.

Classification of computers on the basis of price size and capabilities

- Because of their small size most palmtop computer do not include disk drives.
- However many contain PCMCIA (personal computer memory card international association) insert disc drive models memory and memory and other devices.

Classification of computers on the basis of price size and capabilities

- Palmtops are also called PDAs, hand-held computers, and pocket computers.