

Notes

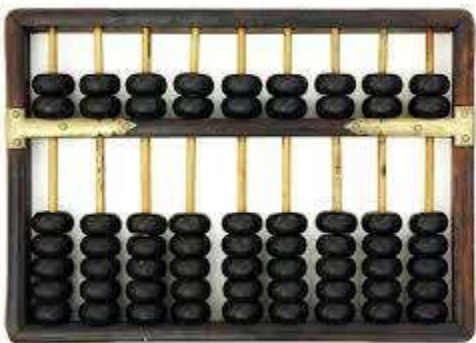
Class XI Computer Science

Evolution of Computer

Imagine you had a job where hour after hour, day after day you would do nothing but compute multiplications. Boredoms would quickly set in, leading to carelessness, leading to mistakes.

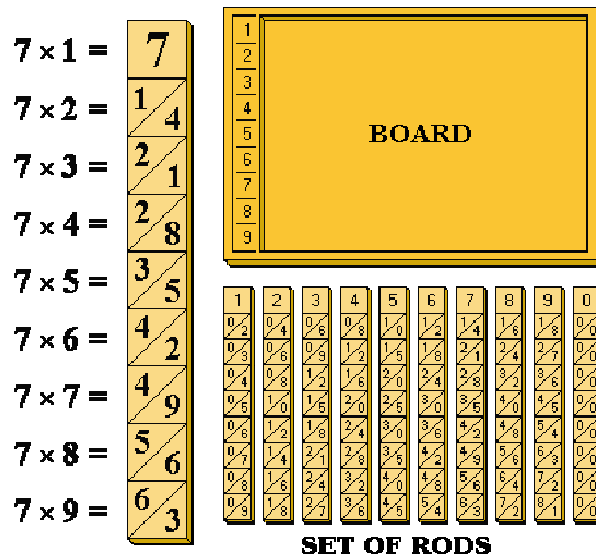
Let us here look on all the calculating and computing devices. As the name suggests computer is a device made for computation includes arithmetical calculations as well as the logical operation, therefore for hundreds of years inventors have been searching for ways to make a nice manual task. Let us see the major milestones in the evolution of today's computer.

Early computing machine Abacus: The Abacus, which emerged about 5,000 years ago in Asia, can be considered as the first computer. It was an early aid for mathematical computations. It is made up of wooden frame with several rows having beads. The frame was divided into two parts called Earth and heaven. Each rod in heaven had two beads and Earth had five beads. This device allows users to make computations using a system of sliding beads arranged on a Rack and aids the memory of the person performing the calculation.



Early Merchant used the Abacus to keep trading transactions but as the use of paper and pencil spread particularly in Europe, the Abacus lost its importance. The Abacus is still in use today, principally in the Far East. A skilled Abacus operator can work on addition and subtraction problems at the speed of a person equipped with the hand calculator. However multiplication and division was slower.

Napier's bones: In 1617 an eccentric Scotsman named John Napier invented logarithms technology that allows multiplication to be performed via addition.



The magic ingredient is the logarithm of each operand which was originally obtained from a printed table but Napier also invented an alternative to tables, where the logarithm values were carved on Ivory a stick, which was named Napier's bones.

Pascaline: Pascal's adding machine in 1642. Blaise Pascal the 18 years old son of a French tax collector invented a numerical wheel calculator to help his father with his duties. This brass rectangular box also called a Pascaline used 8 movable dials to add up to 8 digits. Pascal's device used a base of 10.



For example: As one dial moved ten notches or one complete round, It moved the next dial which represented the tens column one place, when the tens dial moved one round and the dial representing the hundreds place move to one notch and so on.

It's drawback was, it's limitation to addition and subtraction only.

Leibniz calculator: In 1694 a German Mathematician and Philosopher Gottfried Wilhelm (von) Leibniz improved the Pascaline by creating a machine that could also multiply like its predecessor, Leibniz's mechanical multiplier works by a system of gears and dials.



Jacquard loom: In 1801 the Frenchman Joseph Marie Jacquard invented a power loom that could base it's weave upon a pattern automatically, read from punched wooden cards held together in a long row by rope. In the Jacquard Loom, the

presence or absence of each hole in the card physically allows a coloured thread to pass a stop that thread.

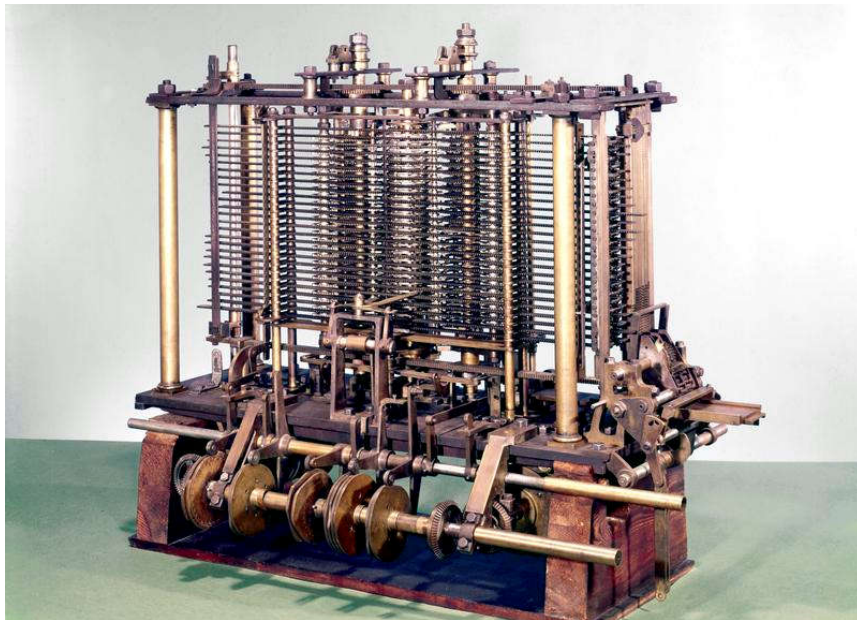


Difference Engine by Charles Babbage the real beginnings of computers, as we know them today. An English Mathematics professor Charles Babbage is known as the father of the computer. Babbage noticed a natural harmony between machines and mathematics, machines with best performing task repeatedly without mistake while mathematics particularly the production of mathematics tables often required the simple repetition of steps.



In 1822 Babbage proposed a steam driven calculating machine, the size of a room to perform differential equation called a 'Difference Engine'. This machine would be able to compute tables of numbers such as logarithm table and would have a stored program and could perform calculations and print the results are automatically.

Analytical engine: After working on the Difference Engine for 10 years Babbage was suddenly inspired to begin work on the first general purpose computer, which he called the 'Analytical Engine'.



This device was as large as a house and powered by 6 steam engines would be more general purpose in nature because it would be Programmable. Thanks to the 'Punch card' technology of Jacquard. But it was Babbage who made an important intellectual leap regarding the punch card. Babbage saw the pattern of holes could be used to represent an abstract Idea such as a problem statement or the raw data required, for that problem solution for the more, Babbage realized that punched paper could be employed as a storage mechanism holding computed numbers for future reference because of the connection to the

Jacquard Loom. Babbage called the two main parts of Analytical Engine, the **Store** and the **Mill** as both terms are used in the weaving industry. The **Store** was where numbers were held and the **Mill** was where they were woven into new results. In a modern computer the same parts are called the **Memory Unit** and the **Central Processing Unit**.

Lady Augusta Ada, the first programmer, Babbage befriended Augusta Ada Byron, the daughter of the famous poet Lord Byron, who was fascinated by Babbage's ideas. She learnt enough about the design of the Analytical Engine to begin fashioning programs for the still un-built machine while Babbage refused to published his knowledge for another 30 years and Ada wrote a series of notes where ensued details sequences of instructions. She had prepared for the Analytical Engine.



The Analytical Engine remained un-build, because the British Government refused to get involved with this. But Ada earned spot in History as the first Computer Programmer. Ada invented the subroutine and was the first to recognize the importance of looping. In the 1980, is the US defense department named a programming language ADA, in her honour.

Tabulating Machine: Herman Hollerith in 1889 an American inventor Herman Hollerith also applied the Jacquard Loom concept to computing. His first task was to find a faster way to compute the US census. Hollerith used cards to store data, and information, which he is fed into a machine that compiles the results mechanically. Each punched on a card represented one number and the combination of two punches presented one letter, as many as 80 variables could be stored on a single card. Census takers compiled their results in just six weeks with Hollerith machine instead of 10 years. In addition to their speed the punch card served as a storage method for data and they helped reduce the computational errors.



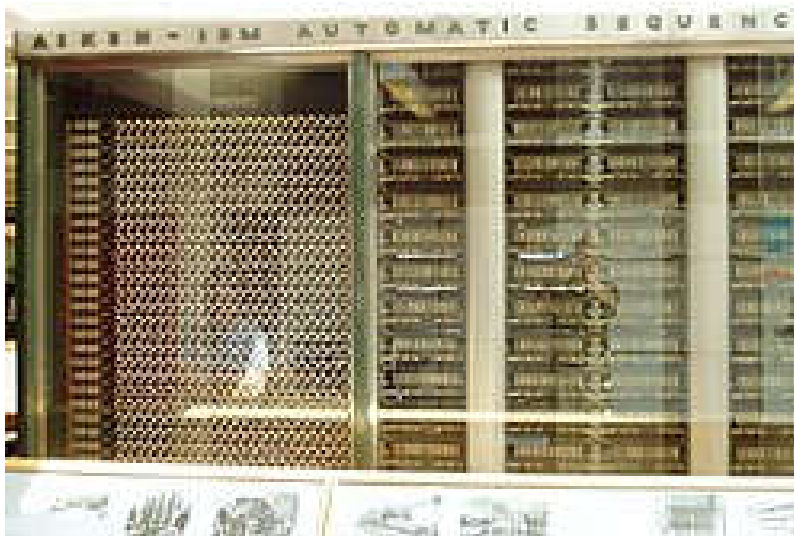
Hollerith brought his punched card reader into the business world founding tabulating machine company in 1896, later to become International Business Machines (IBM) in 1924. After a series of mergers in the ensuing years several engineers made other significant advances.

EDVAC-John Von Neumann. In the mid 1948 John Von Neumann joined the University of Pennsylvania team initiating concepts in computer Design that remained Central to computer engineering for the next 40 years. Von Neumann

designed the Electronic Discrete Variable Automatic Computer or EDVAC in 1945 with the memory to hold both a stored program as well as data.



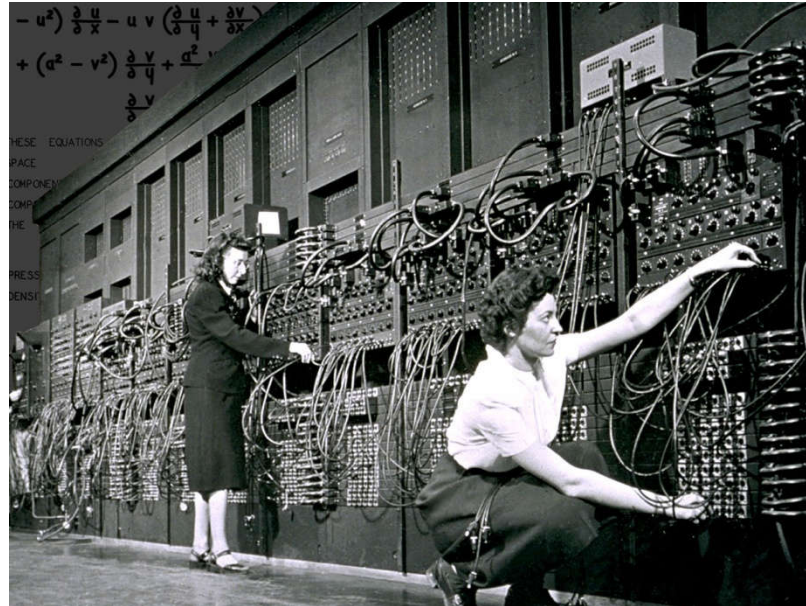
Mark 1- Howard H Aiken, a Harvard engineer working with IBM succeeded in producing and all electronic calculator by 1944, it was about half as long as a football field and contain about 500 miles of wiring.



The Harvard IBM automatic sequence control computer or MARK 1 for short electronic relay computer the machine was slow and inflexible. but it could perform basic arithmetic as well as more complex equation.

ENIAC: Another computer development was the Electronic Numerical Integrator and Computer or ENIAC. This was the first general purpose electronic digital

computer invented by John Mauchly and J Presper Eckert in 1946. This is the story of the evolution of computers after going through a long journey of the evolution process the first electronic computer was invented the development journey continues.



UNIVAC in 1951 J. Presper Eckert and John Mauchly developed a Universal Automatic Computer or UNIVAC. It is the first commercial electronic computer, that could handle text and numeric data.

