HISTORY OF COMPUTER

Evolution of computer is a study of past development of computer i.e. it is meant by the gradual improvements of accuracy, speed and efficiency of computers through generations, whereas generations of computers may be defined as the development of computer in an average period of time in which old computer technology may be replaced by newer technology.

Ancient people lived on the earth for centuries without counting.Then, they started to count their ten figures. It become so difficult to live and to remember anything. These phenomena were gradually replaced by the use of stones, counting notches on sticks or marks on walls. The different generations are described below which has helped the humans for keeping records with the passing of time.

A) The Mechanical Era (Zeroth generation)

The calculator of this age was developed by using mechanical components like wood, metal, stone, bone, etc. It was used for simple mathematical calculations. Some of the popular calculations used in this ages are:
   1. **Abacus**

In ancient period, it was used to calculate mathematical calculation. It was used for performing simple calculation like counting, addition, subtraction and multiplication of number. An abacus consists of a rectangular frame carrying a number of wooden rods. Mid-bar divides each of these rods in top unequal -upper and lower parts.
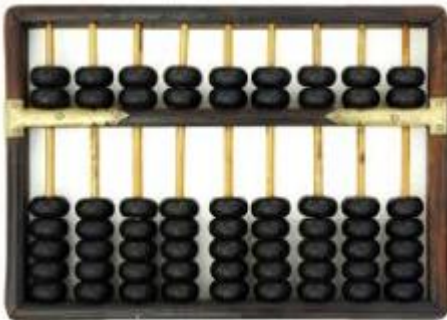

Fig: Abacus

Source: www.computerhistory.org

The upper part is called heaven,whereas lower part is called earth.The heaven consists of two beads, whereas the earth part consists of five beads to each rod. The value of bead on heaven part is five and earth is one. Each abacus consists of nine or eleven or thirteen rods.
   2. **Napier's Bones - John Napier (1550-1617 AD)**

THE SCOTTISH mathematician John Napier first published the table of logarithms in 1614 AD. It was very used and consists of a large number of calculations.

He invented bone rods and used bones to demonstrate by subtracting and multiplication by addition according to his principle. These are made of strips of bones on which numbers were carved and painted that`s why it is also called Napier's bone.

Fig: Napier bone ^{Source:www.microscopy-uk.org.uk}

3. Slide Rule: William Oughtred (1575-1660AD)

It is a rectangular device-slide-rule. It was a calculating device based on the principle of a log. A rule consists of two graduated scales, one of which slips upon other. It is devised in such a way that suitable alignment of one scale against the other makes it possible to find products and quotient of any numbers.
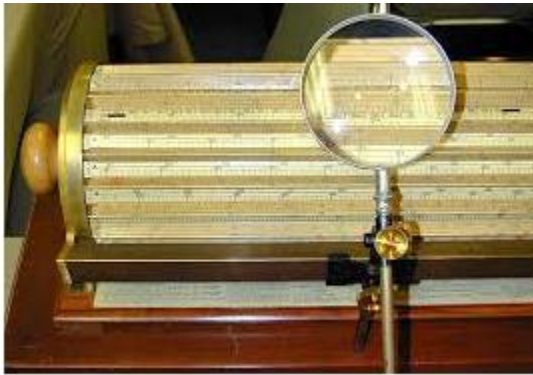

Fig: Oughtred ruler

Source: www.oughtred.org

4. Pascal Calculator: Blaise Pascal (1623-1662AD)

The man name Blaise Pascal, was a brilliant mathematician and religious thinker. Pascal made a mercury barometer and measured atmospheric pressure to assist his father in his work accounting. Pascal invented the first mechanical calculation machine in Paris.

Fig: Pascal Calculator

5. *Leibniz Calculator* - Baron Gottfried Wilhelm Von Leibniz (1646-1716AD)

He develops a new method of calculation called 'Calculus'. He modified the masculine machine and invented a first calculator, Stepped Reckoner, which was able to perform automatic addition, subtraction, multiplication, division, but could find out square root. Each with nine teeth of varying lengths instead of wheels it was called 'Leibniz Calculator' or 'Stepped Reckoner'.

Fig : Leibniz Calculator

6. *Jacquard loom* - Joseph Marie Jacquard (1752-1834 AD)

The french man, Joseph Marie Jacquard, was a textile manufacturer who invented a mechanism for automated weaving clothes for the textile industry at Lyon, in 1802 AD. This machine was used to automatically control weaving looms to facilitate the production of weaving cloth with complex patterns.

Fig: Jacquard loom

7. *Analytical engine*-Charles Babbage (1791-1871 AD)

The English Professor and Mathematician, Charles Babbage, invented the Different Engine at Cambridge University, in 1822 AD. This machine can solve differential equations and calculate various mathematical functions. It is also called " Analytical Engine ".
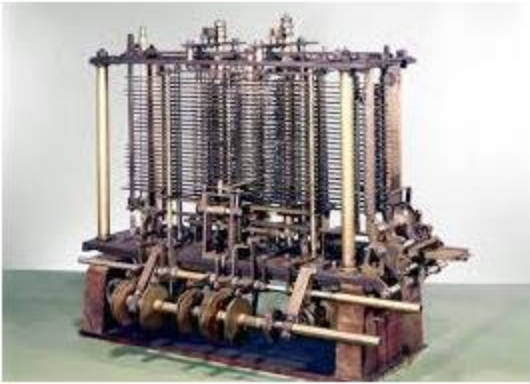
Fig: Analytical engine

8. Lady Augusta Ada Byron Lovelace (1515-1852 AD)

The English intelligent and independent-minded woman, Lady Augusta, was a daughter of English poet Lord Byron and a very Great follower, assistant of Charles Babbage. Lady documents Babbage`s work and writes programs for Babbage.

This plan is now regarded as the first computer program. That`s why, she was considered the first computer programmer and a software language developed by the US Defense Department, was named Ada in her honor.

### 9. Herman Hollerith (1860-1929 AD)

An American Inventor, Herman Hollerith, also applied the Jacquard loom concept in computing and applies for patents for an automatic punch-card tabulating machine. He invented a machine knows as " Tabulating Machine ". This device could process on the punch cards and perform census calculating faster than ever before.

Source:en.wikipedia.org

10 John Von Neumann (1903-1975 AD)

The Hungarian Mathematician, John gave an idea of stored program computer in the sense that program is stored internally in the main memory of the computer along with its associated data, in 1945. So, he is called the "Father of Stored Program". Before that, program required for the computer were integrated and written permanently in chips. So, modification of program was not possible. But, after Neumann, such programs were stored on a computer in some storage media, so modification was easy and flexible.
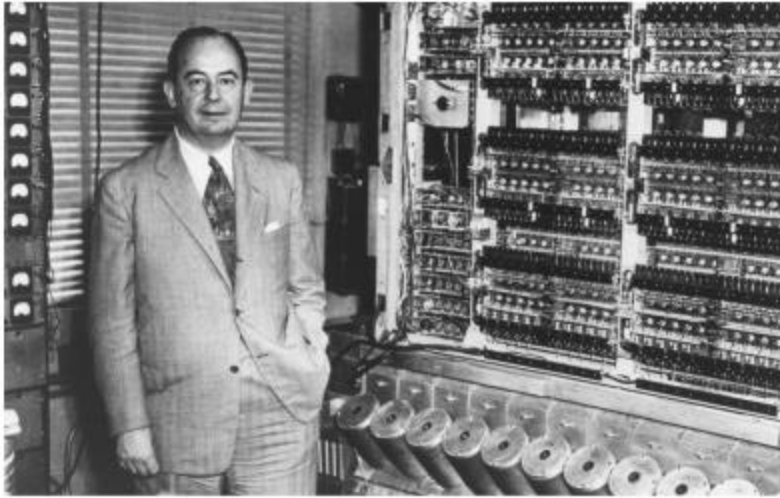
B.) The Electro-Mechanical Era

The calculator of this age was developed by using mechanical and electronic component vacuum tube.Successful general purpose mechanical computers were built, in the 1930s. Konrad Zuse developed mechanical computer, the Z1, in 1983 in Germany.

- **The Mark I Computer (1937 - 1944)**

A Professor of Physics, Howard H. Aiken designed a general purpose mechanical computer at Harvard University and IBM Automatic Sequence Controlled Calculator (IBM ASCC). It was the first fully automatic calculating machine and later as Harvard Mark I.

It used binary numbers for its operation. Later, Mark II was invented by Aiken and his colleagues that were working electromechanical relays for its operation. Mark II used 19000 valves.

- **The Mark II Computer**

It used about 18 thousand vacuum tubes as the main memory device with 7 lakes 50 thousand parts. It is 51 feet long, 8 feet height and 3 feet wide as bulky in size.It was capable of performing five basic arithmetic operations; additions, subtraction, multiplication, division and table reference. The result was printed at the rate of one result per five seconds.

- **The Atanasoff-Berry Computer (1939 - 1942)**

In 1939, John Vincent Atanasoff and Clifford Berry designed Atanasoff-Berry computer or ABC solving systems of mathematical simultaneous equation. It used 18000 valves and other 45 valves for internal logic and capacitors for storage.

It used punch cards as input and output operation i.e secondary. It is considered as the first computing machine which introduced the idea of binary arithmetic, regenerative memory and logic circuits.

- **The Colossus (1941 - 1944)**

In 1944, Colossus computer is designed by Alan M. Turing and build by British mathematician Alan Mathison Neuman, Alan with some colleagues, creates a computer named colossus at the University of Manchester, England, which comprised 1800

It was one of the world's earliest working programmable electronic digital computers. Colossus was a special purpose machine that suited a narrow range of tax (for example, it was capable of performing decimal multiplication).

C) The Electronic Computer Era

The computers of this age are developed by using electronic components like a vacuum tube, transistors IC, VLSI, etc. These computers are smaller, faster and more reliable.
- **The Eniac (1943-1946)**

In 1946, John W. Mauchly and J.presper Eckert constructed ENIAC (Electronic Numerical Integrated and Calculator), at the Moore School of Engineering of the University of Pennsylvania. USA ENIAC was the first popular general purpose all electronic digital computers. John Von Neumann was the consultant of the ENIAC project.

It was a very large machine weighing about 30 tons and containing about 17,468 vacuum tubes, 70,000 resistors, 5 million soldered joints and it consumed 160 kilowatts.
- **The EDVAC (1946-1952)**

EDVAC (Electronic Discrete Variable Automatic Computer) was developed by Dr.John Von Neumann,and a member of the Moore School of Engineering of the Unversity of Pennslyvania,J.P Eckert, and J.W Mauchly. The EDVAC is used for more school personnel and the Ballistics Research Laboratory of the US Army,which was based on Jhon Von Neumann`s ideas of Stored Program".
- **The UNIVAC (1951)**

UNIVAC (Universal Automatic Computer) was developed by J.P.Eckert and J. Mauchly in 1951. It was the first computer manufactured for commercial use and general purpose digital computer.It was designed to handle both numeric and textual information. Before this, all the computers were either used for defense or census was by General Electrical Corporation in 1954.