History of Computers

Before computers were developed people used sticks, stones, and bones as counting tools.

As the technology advanced and the human mind improved with time more computing devices were developed like Abacus, Napier's Bones, etc. These devices were used as computers for performing mathematical computations but not very complex ones. Some of the popular computing devices are described below, starting from the oldest to latest or advanced technology developed:

Abacus

Around 4000 years ago, the Chinese invented the Abacus, and it is believed to be the first computer. The history of computers begins with the birth of the abacus.

Structure: Abacus is basically a wooden rack that has metal rods with beads mounted on them.

Working of abacus: In the abacus, the beads were moved by the abacus operator according

to some rules to perform arithmetic calculations. In some countries like China, Russia, and Japan, the abacus is still used by their people.

Napier's Bones

Napier's Bones was a manually operated calculating device and as the name indicates, it was invented by John Napier. In this device, he used 9 different ivory

Pascaline

It is also called as an Arithmetic Machine or Adding Machine. A French mathematician-philosopher Blaise Pascal invented this between 1642 and 1644. It was the first mechanical and automatic calculator. It is invented by Pascal to help his father, a tax accountant in his work or calculation. It could perform addition and subtraction in quick time. It was basically a wooden box with a series of gears and wheels. It is worked by rotating wheel like when a wheel is rotated one revolution, it rotates the neighboring wheel and a series of windows
is given on the top of the wheels to read the totals.

Stepped Reckoner or Leibnitz wheel

A German mathematician-philosopher Gottfried Wilhelm Leibnitz in 1673 developed this device by improving Pascal's invention to develop this machine. It was basically a digital mechanical calculator, and it was called the stepped reckoner as it was made of fluted drums instead of gears (used in the previous model of Pascaline).

Difference Engine

Charles Babbage who is also known as the "Father of Modern Computer" designed the Difference Engine in the early 1820s. Difference Engine was a mechanical computer which is capable of performing simple calculations. It works with help of steam as it was a steam-driven calculating machine, and it was designed to solve tables of numbers like logarithm tables.

Analytical Engine

Again in 1830 Charles Babbage developed another calculating machine which was Analytical Engine. Analytical Engine was a mechanical computer that used punch cards as input. It was capable of performing or solving any mathematical problem and storing information as a permanent memory (storage).

Tabulating Machine

Herman Hollerith, an American statistician invented this machine in the year 1890. Tabulating Machine was a mechanical tabulator that was based on punch cards. It was capable of tabulating statistics and record or sort data or information. This machine was used by
U.S. Census in the year 1890. Hollerith's Tabulating Machine Company was started by Hollerith and this company later became International
Business Machine (IBM) in the year 1924.

Differential Analyzer

Differential Analyzer was the first electronic computer introduced in the year 1930 in the United States. It was basically an analog device that was invented by Vannevar Bush. This machine consists of vacuum tubes to switch electrical signals to perform calculations.
It was capable of doing 25 calculations in few minutes.

Mark I

In the year 1937, major changes began in the history of computers when Howard Aiken planned to develop a machine that could perform large calculations or calculations involving large numbers. In the year 1944, Mark I computer was built as a partnership between IBM and Harvard. It was also the first programmable digital computer marking a new era in the computer world.

Classification of Computers

The computer systems can be classified on the following basis:

1. On the basis of size.
2. On the basis of functionality.
3. On the basis of data handling.

Classification on the basis of size

Super computers : The super computers are the most high performing system. A supercomputer is a computer with a high level of performance compared to a general-purpose computer. The actual Performance of a supercomputer is measured in FLOPS instead of MIPS. All of the world's fastest 500 supercomputers run Linux-based operating systems. Additional research is being conducted in China, the US, the EU, Taiwan and Japan to build even faster, more high performing and more technologically superior supercomputers. Supercomputers actually play an important role in the field of computation, and are used for intensive computation tasks in various fields, including

quantum mechanics, weather forecasting, climate research, oil and gas exploration, molecular modeling, and physical simulations. and also Throughout the history, supercomputers have been essential in the field of the cryptanalysis. eg: PARAM, jaguar, roadrunner.

Mainframe computers : These are commonly called as big iron, they are usually used by big organisations for bulk data processing such as statics, census data processing, transaction processing and are widely used as the servers as these systems has a higher processing capability as compared to the other classes of computers, most of these mainframe architectures were established in 1960s, the research and development worked continuously over the years and the mainframes of today are far more better than the earlier ones, in size, capacity and efficiency. Eg: IBM z Series, System z9 and System z10 servers.

Mini computers : These computers came into the market in mid 1960s and were sold at a much cheaper price than the main frames, they were actually designed for control, instrumentation, human interaction, and communication switching as distinct from calculation and record keeping, later they became very popular for personal uses with evolution. In the 60s to describe the smaller computers that became possible with the use of transistors and core memory technologies, minimal instructions sets and less expensive peripherals such as the ubiquitous Teletype Model 33 ASR.They usually took up
one or a few inch rack cabinets, compared with the large mainframes that could fill a room, there was a new term “MINICOMPUTERS” coined Eg: Personal

Micro computers : A microcomputer is a small, relatively inexpensive computer with a microprocessor as its CPU. It includes a microprocessor, memory, and minimal I/O circuitry mounted on a single printed circuit board. The previous to these computers, mainframes and minicomputers, were comparatively much larger, hard to maintain and more expensive. They actually formed the foundation for present day microcomputers and smart gadgets that we use in day to day life. Eg: Tablets, Smartwatches.

Classification on the basis of functionality

Servers : Servers are nothing but dedicated computers which are set-up to offer some services to the clients. They are named depending on the type of service they offered. Eg: security server, database server.

Workstation : Those are the computers designed to primarily to be used by single user at a time. They run multi-user operating systems. They are the ones which we use for our day to day personal / commercial work.

Information Appliances : They are the portable devices which are designed to perform a limited set of tasks like basic calculations, playing multimedia, browsing internet etc. They are generally referred as the mobile devices. They have very limited memory and flexibility and generally run on “as-is” basis.

Embedded computers : They are the computing devices which are used in other machines to serve limited set of requirements. They follow instructions from the non-volatile memory and they are not required to execute reboot or reset. The processing units used in such device work to those basic requirements only and are different from the ones that are used in personal computers- better known as

Classification on the basis of data handling

Analog : An analog computer is a form of computer that uses the continuously-changeable aspects of physical fact such as electrical, mechanical, or hydraulic quantities to model the problem being solved. Any thing that is variable with respect to time and continuous can be claimed as analog just like an analog clock measures time by means of the distance traveled for the spokes of the clock around the circular dial.

Digital : A computer that performs calculations and logical operations with quantities represented as digits, usually in the binary number system of “0” and “1”, “Computer capable of solving problems by processing information expressed in discrete form. from manipulation of the combinations of the binary digits, it can perform mathematical calculations, organize and analyze data, control industrial and other processes,
and simulate dynamic systems such as global weather patterns.

Hybrid : A computer that processes both analog and digital data, Hybrid computer is a digital computer that accepts analog signals, converts them to digital and processes them in digital form

Thank you

Sources :