First Generation Computers: Vacuum Tubes (1940-1956)

The period of first generation was from 1946-1959. The computers of first generation used vacuum tubes as the basic components for memory and circuitry for CPU (Central Processing Unit). These tubes, like electric bulbs, produced a lot of heat and the installations used to fuse frequently. The first computer systems used vacuum tubes for circuitry and magnetic drums for memory, and were often enormous, taking up entire rooms. These computers were very expensive to operate and in addition to using a great deal of electricity, the first computers generated a lot of heat, which was often the cause of malfunctions.

First generation computers relied on machine language, the lowest-level programming language understood by computers, to perform operations, and they could only solve one problem at a time. It would take operators days or even weeks to set-up a new problem. Input was based on punched cards and paper tape, and output was displayed on printouts.

The input to the computer was given through punched cards and paper tapes. The output displayed as printouts. No translator (translates from programming language to machine or computer language) was used to compile the programming language. The instructions to computer was given directly in machine language, i.e 0's and 1's. The first generation computers are mainly used for scientific research.

In this generation, mainly batch processing operating system was used. Punch cards, paper tape, and magnetic tape was used as input and output devices. The computers in this generation used machine code as the programming language.

The main features of the first generation are −

Vacuum tube technology

Unreliable

Supported machine language only

Very costly

Generated a lot of heat

Slow input and output devices

Huge size

Need of AC

Non-portable

Consumed a lot of electricity

Some computers of this generation were −

ENIAC

EDVAC

UNIVAC

IBM-701

IBM-650

The UNIVAC and ENIAC computers are examples of first-generation computing devices. The UNIVAC was the first commercial computer delivered to a business client, the U.S. Census Bureau in 1951

Advantages :-

These are the fastest calculating computers at that time.

They perform operations in milliseconds.

Disadvantages :-

These computers are large in size.

Large amount of heat is emitted.

The cost is high.

These computers are non-portable.

The first generation computers solve only one problem at a time.

Air conditioning is required

Machine language is difficult to learn.