COMPUTER APPLICATION

LECTURE NOTE

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Generations of Computers

The word generation means the state of improvement in the product development process. Initially, the generation term was used to distinguish between varying hardware technologies. Nowadays, generation includes both hardware and software, which together make up an entire computer system.

There are five computer generations known till date. Each generation has been discussed in detail along with their time period and characteristics. In the following table, approximate dates against each generation has been mentioned, which are normally accepted. Following are the main five generations of computers.

Sl. No.	Generation & Description
1	**First Generation** The period of first generation: 1946-1959 . Vacuum tube based.
2	**Second Generation** The period of second generation: 1959-1965. Transistor based.
3	**Third Generation** The period of third generation: 1965-1971. Integrated Circuit based.
4	**Fourth Generation** The period of fourth generation: 1971-1980. VLSI microprocessor based.
5	**Fifth Generation** The period of fifth generation: 1980-onwards. ULSI microprocessor based.

First Generation Computers

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. Therefore, they were very expensive and only large organizations were able to afford it.

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
- Generates lot of heat
- Slow input and output devices
- Huge size
- Need of AC
- Non-portable
- Consumes lot of electricity

Some computers of this generation were:

- ENIAC
- EDVAC
- UNIVAC

- IBM-701
- IBM-750

Second Generation Computers

The period of second generation was from 1959-1965. In this generation, transistors were used that were cheaper, consumed less power, more compact in size, more reliable and faster than the first-generation machines made of vacuum tubes. In this generation, magnetic cores were used as the primary memory and magnetic tape and magnetic disks as secondary storage devices.

In this generation, assembly language and high-level programming languages like FORTRAN, COBOL were used. The computers used batch processing and multiprogramming operating system.

The main features of second generation are:

- Use of transistors
- Reliable in comparison to first generation computers
- Smaller size as compared to first generation computers
- Generates less heat as compared to first generation computers
- Consumed less electricity as compared to first generation computers
- Faster than first generation computers
- Still very costly
- AC required

• Supported high level and assembly languages

Some computers of this generation were:

• IBM 1620

• IBM 7094

• CDC 1604

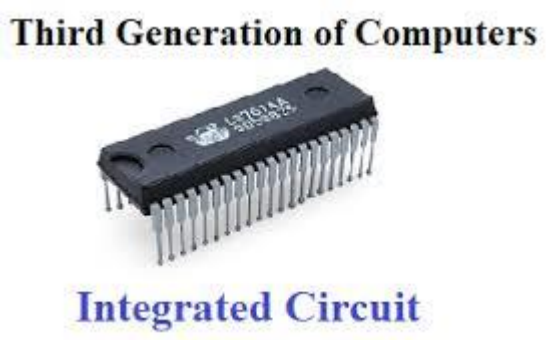
• CDC 3600

• UNIVAC 1108

Third Generation Computers

The period of third generation was from 1965-1971. The computers of third generation used Integrated Circuits (ICs) in place of transistors. A single IC has many transistors, registers, and capacitors along with the associated circuitry.

This development made computers smaller in size, reliable, and efficient. In this generation remote processing, time-sharing, multi-programming operating system were used. High-level languages (FORTRAN-II TO IV, COBOL, PASCAL PL/1, BASIC, ALGOL-68 etc.) were used during this generation.



The main features of third generation are:

• IC used

• More reliable in comparison to previous two generations

• Smaller size

• Generated less heat

• Faster

• Lesser maintenance

• Costly

• AC required

• Consumed lesser electricity

• Supported high-level language

Some computers of this generation were:

• IBM-360 series

• Honeywell-6000 series

• PDP (Personal Data Processor)

• IBM-370/168 • TDC-316

Fourth Generation Computers

The period of fourth generation was from 1971-1980. Computers of fourth generation used Very Large Scale Integrated (VLSI) circuits. VLSI circuits having about 5000 transistors and other circuit elements with their associated circuits on a single chip made it possible to have microcomputers of fourth generation.

Fourth generation computers became more powerful, compact, reliable, and affordable. As a result, it gave rise to Personal Computer (PC) revolution. In this generation, time sharing, real time networks, distributed operating system were used. All the high-level languages like C, C++, DBASE etc., were used in this generation.

The main features of fourth generation are:

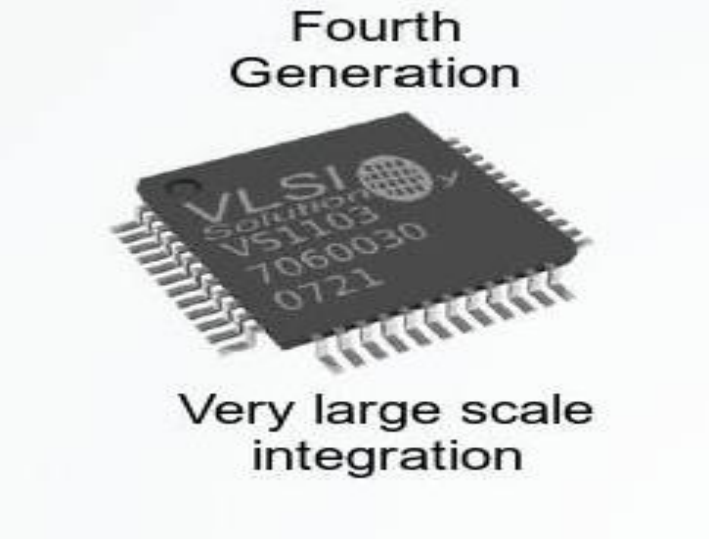
• VLSI technology used

• Very cheap

• Portable and reliable

• Use of PCs

• Very small size



• Pipeline processing

• No AC required

• Concept of internet was introduced

• Great developments in the fields of networks

• Computers became easily available

Some computers of this generation were:

• DEC 10

• STAR 1000

• PDP 11

• CRAY-1(Super Computer)

• CRAY-X-MP(Super Computer)

Fifth Generation Computers

The period of fifth generation is 1980-till date. In the fifth generation, VLSI technology became ULSI (Ultra Large Scale Integration) technology, resulting in the production of microprocessor chips having ten million electronic components.

- The fifth generation computers are completely based on a new concept of artificial intelligence.
- AI is an emerging branch in computer science, which interprets the means and method of making computers think like human beings
- Although such computers are still in development, there are certain applications like voice recognition which is widely being used today.
- In the fifth generation of computers the aim is to develop devices that respond to natural language input and are capable of learning and self-organization.
- All the high-level languages like C and C++, Java, .Net etc., are used in this generation

- The two most common are LISP and Prolog.

GENERATION OF COMPUTER

First Generation

Vacuum Tubes

Second Generation

Transistors

Third Generation

Integrated Circuit

Fourth Generation

Very large scale integration

Fifth Generation

Ultra large scale integration