**Generations of computers :**

**Generations of computers** are changing with time since it becomes commercially available during early 1950’s. Thereafter, many significant development stages have taken place to improve the efficiency and power of the computers. These stages of development of computers are termed as **first, second, third, fourth and fifth generations of computers.**

**First generations of computers (From 1946-1959) :**

**The following are the characteristics of first generation computers :**

* Vacuum tubes were used as the principal electronic components in the first generations of computers.
* A large amount of space was occupied by these computers.
* Speed was normally measured in milliseconds.
* The first generation of computers had a limited storage capacity to store data, magnetic drums were used for storing data.
* For input and output operations, punched cards were used.
* The first generation of computers generated more heats.
* A huge amount of electricity was consumed.
* Basically, machine languages were used to program the first generations of computers.
* These computers were limited to solving one problem at a time.
* UNIVAC and ENIAC computers are examples of first-generation computing devices.
* The first generations of computers were very costly.

**Also Read:**[**Generations of programming languages**](https://www.csetutor.com/generations-of-programming-languages/)

**Second generations of computers (From 1959-1965):**

**The following are the characteristics of second generation computers :**

* Solid state electronic components such as transistor and diodes were used as the principal electronic components in the second generation of computers.
* Speed was normally measured in microseconds.
* The heat was reduced marginally as compared to the first generations of computers.
* Processing speed and reliability had improved remarkably.
* Magnetic tapes besides punch cards were also used for input-output operations in the second generation of computers.
* A huge improvement of storage capacity.
* Assembly languages were used to program the second generations of computers.
* The second generations of computers consumed lower electricity and space compared to the first generation of computers.
* IBM 1620, UNIVAC 1108 etc are some example of the second generation of computers.

**Third generations of computers (From 1965-1971) :**

**The following are the characteristics of third generation computers :**

* Integrated Circuits (IC) were used as the principal electronic components in the third generation of computers.
* The speed of computation was normally measured in nanoseconds.
* They occupied less storage and consumed less electricity.
* Monitors, line printers, magnetic tapes etc were used as the primary input-output device.
* This generation’s computers were smaller in size, reliable, and efficient.
* Some important concepts like remote processing, time-sharing, multiprogramming operating system were introduced in the second generation of computers.
* High-level programming languages such as FORTRAN, COBOL, PASCAL etc were used to program the computers.
* They generated less heat and required less maintenance.
* IBM-360 series, Honeywell-6000 series etc are some example of the third generation of computers.

**Also Read:**[**Difference Between Algorithm and Flowchart**](https://www.csetutor.com/difference-between-algorithm-and-flowchart-with-example/)

**Fourth generations of computers (From 1971-1980) :**

**The following are the characteristics of fourth generation computers :**

* Computers of the fourth generation used microprocessor chip i.e. the entire CPU is combined on a single small silicon chip.
* The speed was measured in nano and picoseconds.
* The fourth generation of computers occupied lesser space.
* They are programmed using the high-level languages such as C, C++ etc.
* They were relatively cheap, reliable, portable and also more powerful and affordable than older generations.
* In the fourth generation of computers, time-sharing, real-time networks and distributed operating system were used.
* They were commonly available as personal computers.
* From the concept of the microprocessor, mini and microcomputers were also developed.
* DEC 10, STAR 1000 are some of the examples of fourth generations of computers.

**Fifth generations of computers (From 1980 - Now) :**

**The following are the characteristics of fifth generation computers :**

* In the fifth generation of computers, the super large scale integration (SLSI) chips were used and it introduced the concept of supercomputers.
* The fifth generations of computers can perform millions of instructions in a second.
* Due to the higher performance capability, the speed of computation is very high.
* Reduced Instruction Set Computing (RISC) was used for processing.
* The fifth generation of computers i.e. the supercomputers are very expensive due to its capability.
* All the high-level languages like C and C++, Java etc. are used in this generation.
* Parallel processing hardware and the concept of [Artificial Intelligence](https://en.wikipedia.org/wiki/Artificial_intelligence) is introduced in the fifth generation of computers.