**JUVIE V. CANO BSIT – PROGRAMMING 3-B**

# History of Computers

The first counting device was used by the primitive people. They used sticks, stones and bones as counting tools. As human mind and technology improved with time more computing devices were developed. The history of computer begins with the birth of abacus which is believed to be the first computer. It is said that Chinese invented Abacus around 4,000 years ago.

It was a wooden rack which has metal rods with beads mounted on them. The beads were moved by the abacus operator according to some rules to perform arithmetic calculations. Abacus is still used in some countries like China, Russia and Japan.

| **Five Generations of Computers** | | |
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| **Generations of computers** | **Generations timeline** | **Evolving hardware** |
| First generation | 1940s-1950s | Vacuum tube based |
| Second generation | 1950s-1960s | Transistor based |
| Third generation | 1960s-1970s | Integrated circuit based |
| Fourth generation | 1970s-present | Microprocessor based |
| Fifth generation | The present and the future | Artificial intelligence based |

**The main characteristics of first generation of computers (1940s-1950s)**

* Main electronic component – vacuum tube
* Main memory – magnetic drums and magnetic tapes
* Programming language – machine language
* Power – consume a lot of electricity and generate a lot of heat.
* Speed and size – very slow and very large in size (often taking up entire room).
* Input/output devices – punched cards and paper tape.
* Examples – ENIAC, UNIVAC1, IBM 650, IBM 701, etc.
* Quantity – there were about 100 different vacuum tube computers produced between 1942 and1963.

**Second Generation of Computers**

**The main characteristics of second generation of computers (1950s-1960s)**

Main electronic component – transistor

* Memory – magnetic core and magnetic tape / disk
* Programming language – assembly language
* Power and size – low power consumption, generated less heat, and smaller in size (in comparison with the first-generation computers).
* Speed – improvement of speed and reliability (in comparison with the first-generation computers).
* Input/output devices – punched cards and magnetic tape.
* Examples **–** IBM 1401, IBM 7090 and 7094, UNIVAC 1107, etc.

**Third Generation of Computers**

**The main characteristics of third generation of computers (1960s-1970s)**

* Main electronic component – integrated circuits (ICs)
* Memory – large magnetic core, magnetic tape / disk
* Programming language – high level language (FORTRAN, BASIC, Pascal, COBOL, C, etc.)
* Size – smaller, cheaper, and more efficient than second generation computers (they were called minicomputers).
* Speed – improvement of speed and reliability (in comparison with the second-generation computers).
* Input / output devices – magnetic tape, keyboard, monitor, printer, etc.
* Examples **–** IBM 360, IBM 370, PDP-11, UNIVAC 1108, etc.

**Fourth Generation of Computers**

**The main characteristics of fourth generation of computers (1970s-present)**

* Main electronic component – very large-scale integration (VLSI) and microprocessor.
* VLSI– thousands of transistors on a single microchip.
* Memory – semiconductor memory (such as RAM, ROM, etc.)
  + RAM (random-access memory) – a type of data storage (memory element) used in computers that temporary stores of programs and data (volatile: its contents are lost when the computer is turned off).
  + ROM (read-only memory) – a type of data storage used in computers that permanently stores data and programs (non-volatile: its contents are retained even when the computer is turned off).
* Programming language – high level language (Python, C#, Java, JavaScript, Rust, Kotlin, etc.).
  + A mix of both third- and fourth-generation languages
* Size – smaller, cheaper and more efficient than third generation computers.
* Speed – improvement of speed, accuracy, and reliability (in comparison with the third-generation computers).
* Input / output devices – keyboard, pointing devices, optical scanning, monitor, printer, etc.
* Network – a group of two or more computer systems linked together.
* Examples **–**IBM PC, STAR 1000, APPLE II, Apple Macintosh, etc.

**Fifth Generation of Computers**

**The main characteristics of fifth generation of computers (the present and the future)**

* Main electronic component: based on artificial intelligence, uses the Ultra Large-Scale Integration (ULSI) technology and parallel processing method.
  + **ULSI** – millions of transistors on a single microchip
  + **Parallel processing method** – use two or more microprocessors to run tasks simultaneously.
* Language – understand natural language (human language).
* Power – consume less power and generate less heat.
* Speed – remarkable improvement of speed, accuracy and reliability (in comparison with the fourth generation computers).
* Size – portable and small in size, and have a huge storage capacity.
* Input / output device – keyboard, monitor, mouse, trackpad (or touchpad), touchscreen, pen, speech input (recognise voice / speech), light scanner, printer, etc.
* Example **–** desktops, laptops, tablets, smartphones, etc.