Computer science

Introduction

- Definition of computer
- Computer phases
- Computer operating systems
- Computer generations and artificial intelligence

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❖ Definition of computer

- Computer: An electronic device that stores, retrieves, and processes data, and can be programmed with instructions.
- The word account is the root of the word computer.
- A computer can exist in a variety of sizes and configurations.
- A computer is composed of hardware and software.

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❖ Computer phases

- The computer had three stages through which it reached the form it has today, which are as follows:

1. Foundations of the theory phase
2. Development phase
3. Marketing phase

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1. Foundations of the theory phase

- It includes the phase where scientists develop theories and create mathematical models that provide explanations for all phenomena related to the scientific field of the device.
- This phase extended from 1946 to 1900, and the most significant advancement in the computer field was the production of the first digital computer (ENIAC).

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2. Development phase

- In this phase, designers-engineers invent new devices. A simple initial version of the device is created using the foundations of theory and mathematical models from the first phase. Usually, the initial version is expensive, incomplete, and difficult to use.
- This phase is characterized by the appearance of mainframe computer.

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3. Marketing phase

- The designers in this phase focused on increasing the use of the device to include all people
- This phase for the computer extended from 1970 to 2000 and the following items appeared:

- Personal Computer uses operating system DOS
- Operating system Windows
- Networks Computer
- Internet

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❖ Operating systems

- ✓ It is the most important program that a computer runs. It manages every component related to the memory of the computer and the operations occurring within it.
- ✓ The operating system allows you to use the advanced features of a modern computer without having to learn all the details of how the hardware works.

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- ✓ The most common operating systems of computer are:

1. DOS (Disk Operating System)
2. LINUX.
3. Windows.
4. Unix
5. Mac OS X.

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❖ Computer generations and artificial intelligence

- In the language of computers, generation refers to a change in technology. Initially, the term generation was used to differentiate between various hardware technologies but now refers to both hardware and software, which together make up a computer system.
- Computers have passed through various phases since their appearance until now. these phases can be divided into five generations.

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❖First Generation

- ✓ This generation used vacuum tubes which are vacuum glass tubes that have the ability to pass or stop electrical current without requiring a mechanical transformer. Figure (1-1) shows vacuum tubes.
- ✓ The computers of this generation were huge size, very costly, slow input and output devices, generated lot of heat, and supported machine language only.

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Fig. (1-1) Vacuum Tubes

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❖ Second Generation

- In this generation,

✓ transistors were used instead of vacuum tubes. Transistors is an electronic semiconductor chip that controls the flow of electrical current .Figure (1-2) shows transistors.

✓ Computers became smaller, faster, and had greater storage capacity using magnetic cells.

✓ Assembly language and high-level programming languages like FORTRAN, COBOL were used.

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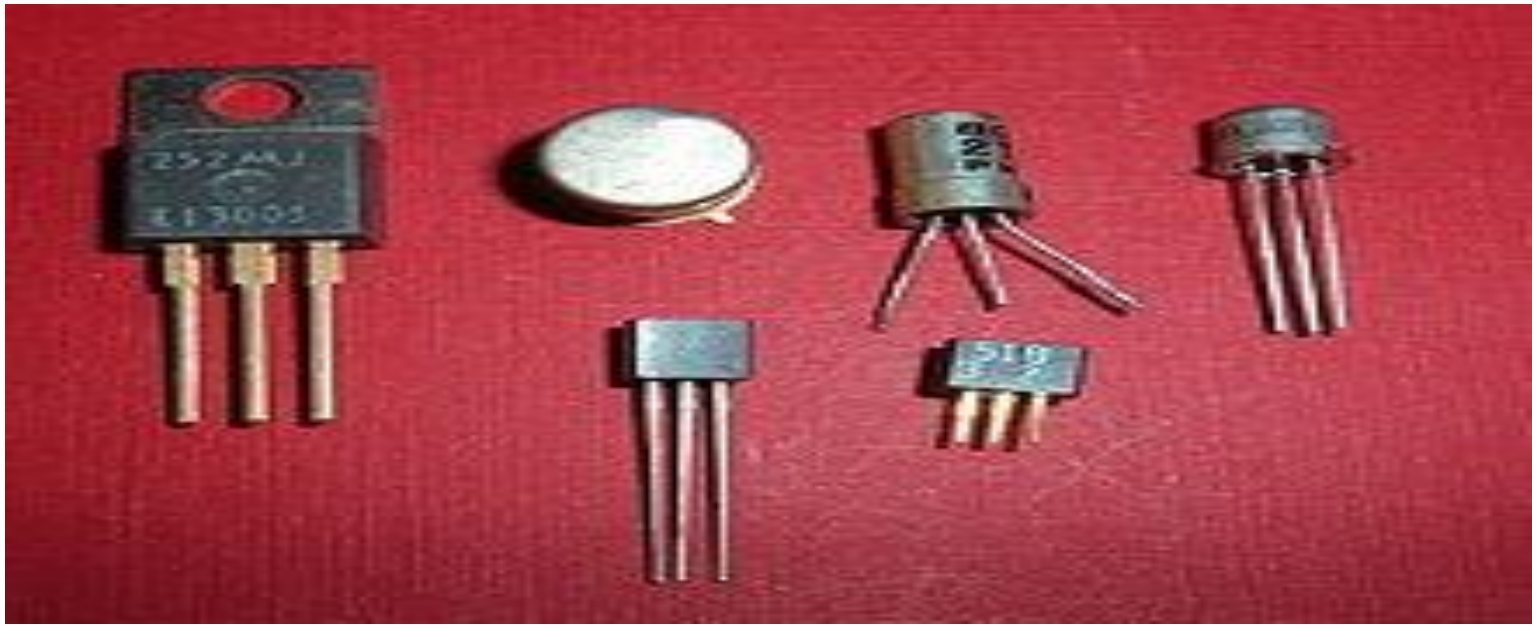

Fig. (1-2) Transistors

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❖ Third Generation

- Third-generation computers were developed using integrated circuits. Integrated circuits are tiny silicon chips with millions of electronic components. Figure (1-3) shows integrated circuits.
- Different computer tasks, including input, output, and processing operations, could be organized in this generation due to the appearance of time-sharing.
- Computer networks began to appear during this generation.

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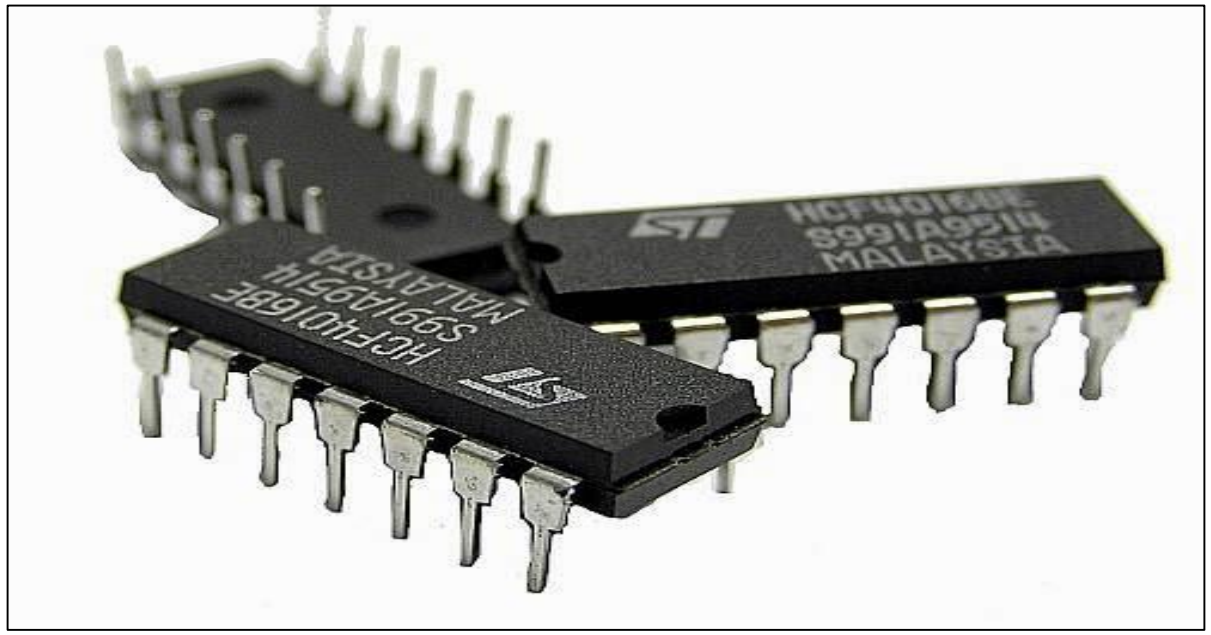

Fig.(1-3) Integrated Circuits.

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❖ Fourth Generation

- In the fourth generation, the first microprocessor appeared, and it became possible to use it in the manufacture of devices such as digital watches, cars, and personal computers. Figure (4-1) shows the microprocessor.
- Data storage methods such as laser discs and magnetic tapes were developed during this generation.

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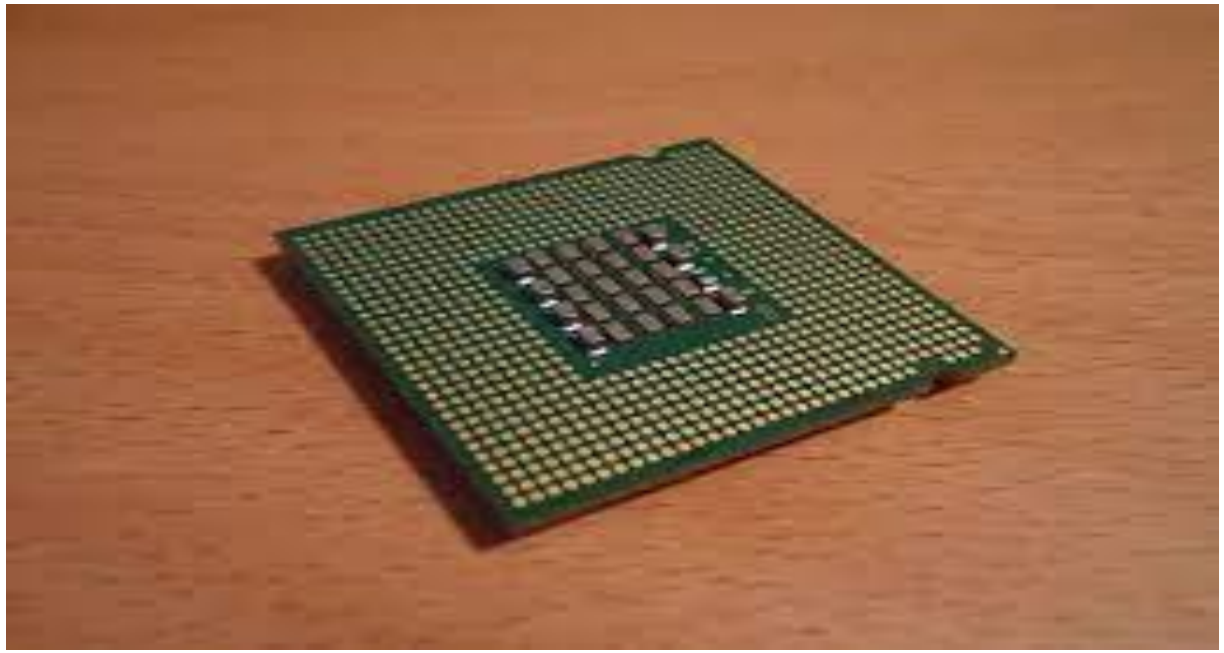

Fig.(1-4) Microprocessor

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❖ Fifth Generation

- ✓ The chips used in this generation are tiny in size, provide huge storage capacities, operate at extremely high speeds, use advanced data processing techniques,
- ✓ This generation also depends on parallel processing devices and artificial intelligence programs (artificial intelligence a new branch of computer science that explains how to make computers think like humans).
- ✓ All the high-level languages like C and Java, Net etc. are used in this generation.