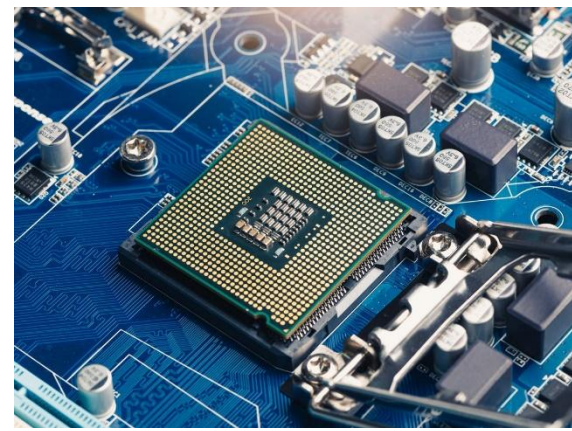


Central Processing Unit (CPU)



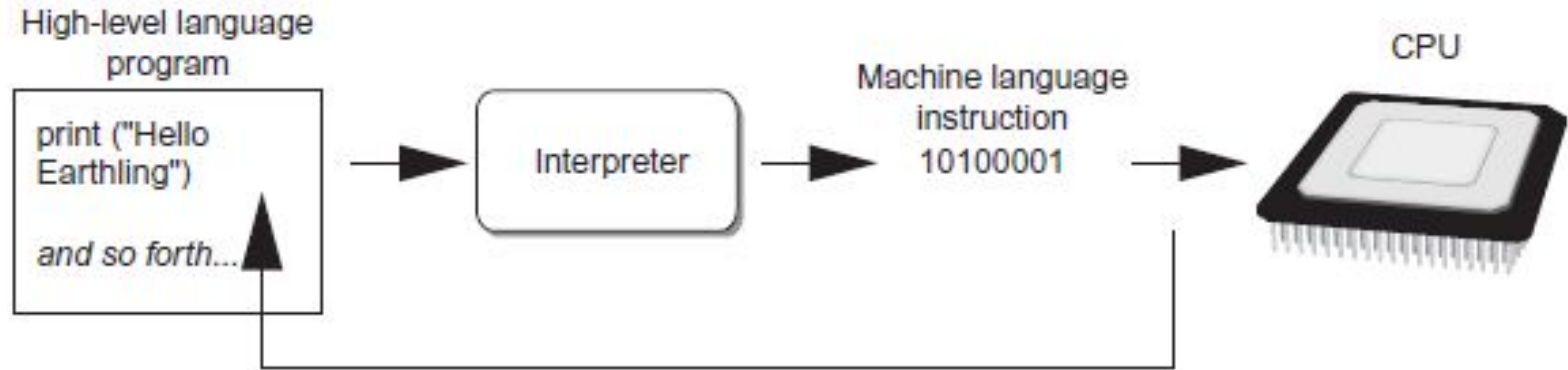
- **Central processing unit (CPU):**
 - Part of the computer that runs programs
 - Most important component (the brain of the computer)
 - Without it, cannot run software
 - Retrieves instructions from memory and executes them
- CPU speed is measured in megahertz (MHz) or gigahertz (GHz)
 - 1 megahertz equalling one million pulses per second
- **Microprocessors:** CPUs located on small chips

- **System software**: programs that control and manage basic operations of a computer
 - Operating system: controls operations of hardware components
 - Utility Program: performs specific task to enhance computer operation or safeguard data
 - Software development tools: used to create, modify, and test software programs

From Machine to Assembly Language

- Impractical for people to write in machine language
- **Assembly language**: uses short words (mnemonics) for instructions instead of binary numbers
 - Easier for programmers to work with
- **Assembler**: translates assembly language to machine language for execution by CPU

Compilers and Interpreters (cont'd)



The interpreter translates each high-level instruction to its equivalent machine language instructions and immediately executes them.

This process is repeated for each high-level instruction.

Figure 1-19 Executing a high-level program with an interpreter