2.2 Exercise - Binary Code

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Abstract

The Central Processing Unit (CPU) is considered the computer's brain and is the central processor that executes instructions from any computer program. The CPU performs basic arithmetic, logic, controlling, and input/output operations specified by software programs (InformationQ.com, 2018). Software programs are written in high-level languages such as Java, C, C++, Python, etc. Unfortunately, CPUs (Central Processing Unit) do not understand these high-level languages used in these programs, resulting in the CPU having to translate these languages into machine code. Machine code is a low-level object language that represents how a computer's hardware and software understand instruction. Machine code is represented either by binary ("1" or "0") or hexadecimal number. This paper will focus on binary code and how the CPU uses it to execute instructions from computer programs.

Computer programs are sets of instructions that are translated into simple binary code that activates the CPU. Binary means "2 states," and these two states can either be called "1" and "0", "true" and "false" or "on" and "off." A CPU can only understand 1's and 0's because the CPU consists of a series of transistors in the "1" or "0" position. These positions create a binary switch represented by a binary digit called a bit or bytes when bits are clustered together. These series of electrical pulses enable users to communicate with computers and give them instructions to execute. Binary code defines how computers take input, where information is stored, and how data is processed. All computers manufactured today are binary devices because binary code is simple and easy to build, and anything from text, images, and graphics can be represented in binary.

Overall, binary code is preprogrammed in computers, thus giving computers the ability to run software programs created with high language code. Binary code will always represent the fundamental background workings of how a computer works by allowing the computer to get input, store information, process information, and produce outputs. Binary code will always be part of the backbone of computers and used every day without the user knowing.

References

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