

## One small step for a man and binary code

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### Анотація

Закодовані за допомогою нулів і одиниць перші слова, сказані людиною, яка ступила на Місяць, можуть щось сказати лише комп'ютеру. Цей код називається бінарним і він присутній в багатьох важливих аспектах нашого життя.

**Ключові слова:** Ніл Армстронг, бінарний код, кодована інформація.

### Abstract

*Coded with the help of zeros and ones, the first words uttered by the person who stepped on the Moon can say something to the computer only. This code is called binary and it is present in many important aspects of our life.*

**Keywords:** Neil Armstrong, binary code, coded information.

In July 1969, when American astronaut Neil Armstrong set foot on the surface of the moon, having realized the age-old dream of a man, the news of this event, instantly breaking 400 thousand kilometers of outer space, reached the city of Houston in Texas state, and then flew around the world. Television showed this scene in millions of flats, and the teletypes gave all details - including Armstrong's short but wonderful speech "This is a small step for man and a giant leap for humanity" - in thousands of newspaper and magazine editions around the world.

The phrase for landing on the moon was drawn up in advance (*That's one small step for a man, but one giant leap for mankind*), but from the excitement Armstrong missed the indefinite article before the word *man*, which is clearly audible in the record. Thus, the meaning of the phrase was distorted: the word *man* without the article means not a *single person*, but a man, as a kind, *humanity*.

An interesting fact is that after his famous phrase he added in an undertone: "Good luck, Mr. Gorski." NASA suggested that it was, perhaps, a challenge thrown to one of the Soviet cosmonauts. However, the verification confirmed that the cosmonaut has no such name in the Union. Then for decades at any opportunity, at all meetings and conferences, Armstrong was asked what his strange statement meant. Neil in reply only smiled mysteriously and replied that he could not say anything.

But no matter what Armstrong made a mistake and to whom such a cryptic message was addressed, the greatness of the event could not spoil such a trifle. Information about the landing on the moon traveled around the world. Much of this information traveled from machine to machine in the form of a special code consisting of pulses of electronic equivalent of zeros and ones.

The fact that the connection between the man who landed on the Moon and the Earth celebrating this event was carried out with the help of zeros and ones, deeply symbolic and logical, because these signs of the binary system of numbers played in this historical achievement thousands of all possible roles. With their help, everything was encoded - from the commands given to the spacecraft during take-off, to instructions, thanks to which the descent vehicle of the Armstrong expedition, when returning to Earth, entered the earth's atmosphere at an appropriate angle. The same thing is happening everywhere in our computerized world. In its digital basis, the computer, regardless of its size and

purpose, represents a system for transmitting information expressed in the form of zeros and ones. What is called a binary code.

A binary code is a representation of information in a combination of 2 characters 1 or 0, as they say in programming is or not, true or false. Someone can show this very difficult, but in fact a binary code - it's easy! For example, any letter of the alphabet can be represented as a set of zeros and ones. For example, the letter H of the Latin alphabet will have this form in the binary system - 01001000, the letter E - 01000101, the beech L has such a binary representation - 01001100, P - 01010000.

Coded with the help of zeros and ones, the first words uttered by the person who stepped on the Moon can say something to the computer only. On this page Neil Armstrong's statement is coded: "This is a small step for man and a giant leap for mankind." Here is used the so-called American standard code of information exchange, abbreviated ASCII.



The idea of using only two characters to encode information is as old as the world. Drums, which are used by some African tribes, transmit messages in the form of combinations of sonorous and deaf strokes. Another, more modern example of two-character coding is the Morse code, in which the letters of the alphabet are represented by certain combinations of dots and dashes.

Binary representation of numbers is not the only alternative to decimal notation. The ancient Babylonian arithmetic was based on the number 60, and in the habits and language of the Anglo-Saxons we find traces of the decimal system that once dominated the British Isles: 12 months a year, 12 inches per foot, two 12-hour periods in a day, various System of measures, also based on the number 12. Called to life by nothing more than ten fingers of a pair of human hands, the decimal system eventually supplanted all other systems of account, at least in the countries of the West. However, some European thinkers of the Enlightenment, which followed the Renaissance, showed considerable interest in a simple and elegant binary number system. Gradually this system penetrated from one scientific discipline to another, from logic and philosophy into mathematics, and then into technology, where it played an important role at the dawn of the computer revolution.

## СПИСОК ВИКОРИСТАНОЇ ЛІТЕРАТУРИ

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