

The current, most commonly-used numerical system, known as the decimal or Hindu-Arabic system, is position-based; the position of a digit determines its value. For example, the “2” in the decimal number 526 is 20. This is in contrast to the Roman numeral system where the value of each symbol combined with its position relative to other symbol(s) determine the value of the original symbol in the overall number.

While the decimal number system is base-10, the binary number system is a base-2 number system. The base, or *radix*, for a number system is the number of single-digit representations in the number system. That is, a single digit in a radix- n number can be represented by one of n symbols. So, a single binary digit, or *bit*, can be represented by one of two symbols: either a 0 or a 1. Also, a single radix- n digit can represent any number from 0 to $n-1$. For example, a single-digit radix-6 value can be any number from 0 to 5, inclusive. Two other common and important numerical representations are octal(base-8) and hexadecimal(base-16).

13,987 ₁₀	10 ⁴	10 ³	10 ²	10 ¹	10 ⁰	x
	1	3	9	8	7	=
	10,000	3,000	900	80	7	

11_0101_0111 ₂ = 855 ₁₀	2 ⁹	2 ⁸	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰	x
	1	1	0	1	0	1	0	1	1	1	=
	512	256	0	64	0	16	0	4	2	1	