added: 11 Jul 2008 19:33
Edited: 8 Sep 2010 17:16

Ternary balanced system of value

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Ternary balanced system of value - a non-standard positional number system. The base system is equal 3, but it differs from the usual ternary system that figures are $-1, 0, 1$. As used $-1$for single digit is very uncomfortable, it usually takes some special notation. Conditions are denoted by minus one letter z.

For example, the number 5in the ternary system is balanced as written $1zz$, and the number -5- as $z11$. Ternary balanced system value allows you to record negative numbers without writing a single sign "minus". Balanced ternary system allows fractional numbers (for example, $1/3$is written as 0.1).

Translation algorithm

Learn how to translate the numbers in a balanced ternary system.

To do this, we must first convert the number in the ternary system.

It is clear that now we have to get rid of the numbers 2, for which we note that $2 = 3 - 1$, ie we can replace the two in the current discharge on -1, while increasing the next (ie, to the left of it in a natural writing) on the discharge 1. If we move from right to left on the record and perform the above operation (in this case in some discharges can overflow more 3, in this case, of course, "reset" extra triple in the MSB), then arrive at a balanced ternary recording. As is easily seen, the same rule holds true for fractional numbers.

More gracefully above procedure can be described as follows. We take the number in the ternary value is added to it an infinite number $\ldots 11111.11111\ldots$, then each bit of the result subtract one (already without any hyphens).

Knowing now the translation algorithm from the usual ternary system in a balanced, we can easily implement the operations of addition, subtraction, and division - just reducing them to the corresponding operations on ternary unbalanced numbers.