

# The arithmetic of binary equivalents of decimal numbers

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## Abstract

A new concept of binary calculations over floating-point decimal numbers is being proposed. The criterion for the accuracy of the representation of a decimal number by a binary code is the number of matching certain digits of this decimal number and the decimal value of its binary equivalent of limited size. The specified decimal accuracy in binary calculations is provided by the correct decimal rounding of binary numbers. This helps to significantly reduce the dimensionality of binary numbers to approximate the decimal floating-point numbers. It allows you to get a strict value of zero when subtracting decimal numbers in binary code. It provides the implementation of bitwise comparison of binary numbers, which are binary equivalents of decimal numbers. The paper provides algorithms for the correct rounding and exact comparison/subtraction of decimal numbers presented in binary.

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