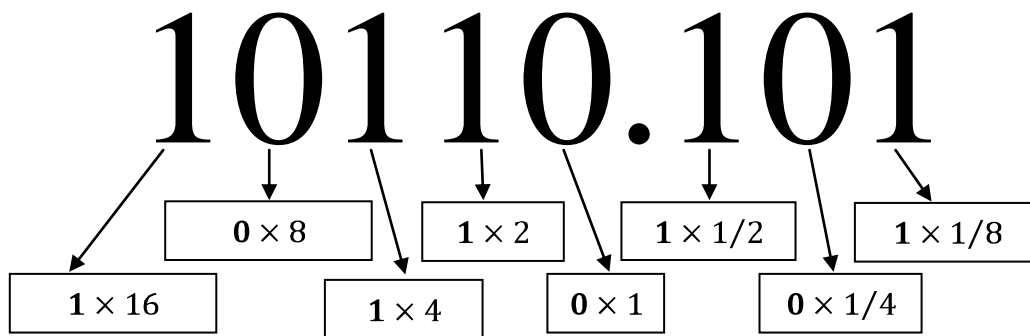


Binary Representation of Numbers

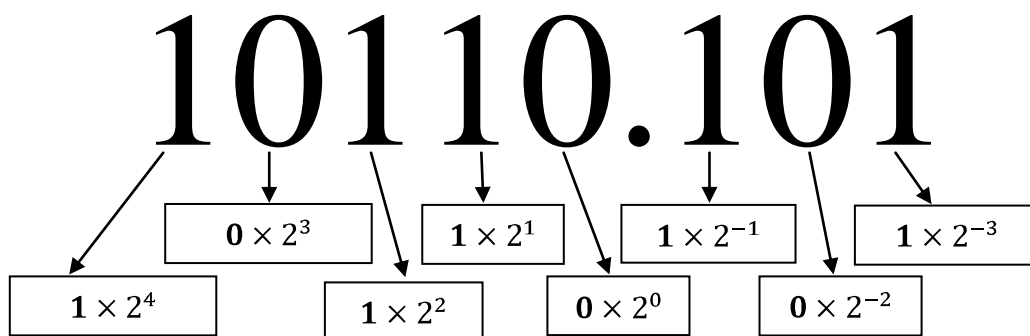
Any number can be represented in the binary system. The binary system works in base 2, and it is the most natural method of representing numbers in computers. Since the base is 2, there are only two digits. In binary numbers the symbols '0' and '1' are normally used. However, in logic we may use the equivalent symbols of 'FALSE' or 'TRUE', in electronics we may have the equivalent symbols of 'OFF' or 'ON'.

The binary system can best be illustrated by using an example. For example



That is $10110.101 = 1 \times 16 + 0 \times 8 + 1 \times 4 + 1 \times 2 + 0 \times 1 + 1 \times \frac{1}{2} + 0 \times \frac{1}{4} + 1 \times \frac{1}{8} = 16 + 4 + 2 + \frac{1}{2} + 0 + \frac{1}{8} = 22\frac{5}{8}$ or 22.625 (as a decimal).

The position of each digit may also be interpreted as the coefficient of each power of 2.



Spreadsheet

On the accompanying spreadsheet it shows the same result as obtained above.

Change of base		number										base						
place original number, original base and new base in the yellow areas		0	0	0	1	0	1	1	0	1	0	1	0	0	0	0	0	2
		0	0	0	0	0	0	0	2	2	6	2	5	0	0	0	0	10