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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Example binary to decimal  1.1001012 = 3710:   |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Exponents | 25 |  | 24 |  | 23 |  | 22 |  | 21 |  | 20 | | Place Values | 32 |  | 16 |  | 8 |  | 4 |  | 2 |  | 1 | | Bits | 1 |  | 0 |  | 0 |  | 1 |  | 0 |  | 1 | | Value | 32 |  |  |  |  | + | 4 |  |  | + | 1 | = | 37 |  * 100011102 = 14210:  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Exponents | 27 |  | 26 |  | 25 |  | 24 |  | 23 |  | 22 |  | 21 |  | 20 | | Place Values | 128 |  | 64 |  | 32 |  | 16 |  | 8 |  | 4 |  | 2 |  | 1 | | Bits | 1 |  | 0 |  | 0 |  | 0 |  | 1 |  | 1 |  | 1 |  | 0 | | Value | 128 |  |  |  |  |  |  | + | 8 | + | 4 | + | 2 |  |  | = | 142 | |  |

Example

Hexa to Decimal

Conversion between hex and binary is easy. Simply substitute four-bit groups for the hex digit of the same value. Specifically:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Hex Digit: | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Bit Group: | 0000 | 0001 | 0010 | 0011 | 0100 | 0101 | 0110 | 0111 |
| Hex Digit: | 8 | 9 | a | b | c | d | e | f |
| Bit Group: | 1000 | 1001 | 1010 | 1011 | 1100 | 1101 | 1110 | 1111 |

example

Hexa to decimal

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| * 5a816 = 144810:  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Exponent: | 162 |  | 161 |  | 160 | | Place Value: | 256 |  | 16 |  | 1 | | Digit Value: | 5 |  | 10 |  | 8 | | Product: | 1280 | + | 160 | + | 8 | = | 1448 |  * 2c0316 = 1126710:  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | Exponent: | 163 |  | 162 |  | 161 |  | 160 | | Place Value: | 4096 |  | 256 |  | 16 |  | 1 | | Digit Value: | 2 |  | 12 |  | 0 |  | 3 | | Product: | 8192 | + | 3072 | + | 0 | + | 3 | = | 11267 | |  |