

## Weighting Table

### Converting binary to decimal/decimal to binary

In computers, bits are grouped to form binary numbers. Binary is a counting system-using base 2 (decimal is base 10).  
 A group of 8 bits is known as a byte (e.g. 10001010).  
 A group of 4 bits (half a byte) is known as nibble (e.g. 1101).

Weight	$2^7$	$2^6$	$2^5$	$2^4$	$2^3$	$2^2$	$2^1$	$2^0$
Digit position	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
Column value	128	64	32	16	8	4	2	1

1. Create the binary weighting table. Make sure the left most number on the table is greater than half the decimal number. Start at the left most weighting value.
2. If the decimal number to be converted is smaller than the current weighting value, place a 0 in that weighting place. If the decimal number is greater than the weighting value, then place a 1 in that weighting position and subtract the weighting value from the decimal number and replace the decimal value with the remaining value.
3. Repeat step 2, moving from left to right, comparing the remaining values with the weighting values as above. Repeat this until you have filled in the entire weighting table.

	octet								octet								octet								octet							
decimal	192								168								0								50							
binary	128	64	32	16	8	4	2	1	128	64	32	16	8	4	2	1	128	64	32	16	8	4	2	1	128	64	32	16	8	4	2	1
	1	1	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0
which bit is turned 0 to 1	192-128=64 64-64=0								168-128=40 40-32=8 8-8=0								zero								50-32=18 18-16=2 2-2=0							
	192=128+64								168=128+32+8								0=0								50=32+16+2							