Hamming Weight

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Hamming distance

a	0	1	1	0	1	1	0	1
b	1	0	1	0	0	1	1	1
$\oplus$	1	1	0	0	1	0	1	0

- The Hamming distnace between two words of equal length is the number of places in which they differ.
- The Hamming distance between a and b is 4.

Hamming weight

a	0	1	1	0	1	1	0	1
$\bar{0}$	0	0	0	0	0	0	0	0
$\oplus$	0	1	1	0	1	1	0	1

- The Hamming of a word is the number of non-zero symbols in it.
- The Hamming weight of a is five.
- This is equal to the Hamming distance between a and the zero word.

Loop-up tables

Exercise

Write an algorithm that counts the number of bits set in an integer.

Loop-up tables

Exercise

Write an algorithm that counts the number of bits set in an integer.

You might try the following methods:

- Bit shifting
- Look-up table
- Kernighan's method
- popcount