

Bitwise Operations

Computing

The six operators, what each does, and the tricks worth knowing.

Operating on the individual bits of an integer.

Operator	Does	Example
& – AND	1 only if both are 1	$12 \& 10 = 8$
 – OR	1 if either is 1	$12 10 = 14$
^ – XOR	1 if exactly one is 1	$12 ^ 10 = 6$
~ – NOT	Flips every bit	$\sim 12 = -13$
<< – left shift	Multiply by 2 each shift	$3 << 2 = 12$
>> – right shift	Divide by 2 each shift	$12 >> 2 = 3$

$x \& 1$ tests odd. $x \& (x-1)$ clears the lowest set bit. $a ^ b ^ b$ returns a — the basis of the XOR swap.