

Operations			
operation	example	before	after
NOT	$x = \sim 0111;$		1000
AND	$x = 0101 \& 0011;$		0001
OR	$x = 0101 0011;$		0111
XOR	$x = 0101 \wedge 0011;$		0110
Left Shift	$x = 0100 \ll 1;$		1000
Right Shift	$x = 0100 \gg 1;$		0010
Set bit 5	$x = (1 \ll 5);$	0b00000000	0b00100000
Clear bit 5	$x \&= \sim(1 \ll 5);$	0b11111111	0b11011111
Wait until bit 5 is set	$\text{while} (!(x \& (1 \ll 5)));$		
Wait until bit 5 is cleared	$\text{while} (x \& (1 \ll 5));$		
Save value of bit 5 into variable	$\text{int var} = x \& (1 \ll 5);$		
Test if bit 5 is set	$\text{if} (x \& (1 \ll 5)) \{ \dots \}$		
Toggle bit 5	$x \wedge= (1 \ll 5);$	0b00000000	0b00100000
Replace modulo of power of two with AND	$x \% y == x \& (y - 1)$	$x \% 64$	$x \& (63)$
Check if integer x is odd	$\text{if} (x \& 1) \{ \dots \}$		
Turn off the rightmost 1-bit	$x = x \& (x - 1);$	0b01011000	0b01010000
Isolate the rightmost 1-bit	$x = x \& (-x);$	0b01110000	0b00010000
Right propagate the rightmost 1-bit	$x = x (x - 1);$	0b10111100	0b10111111
Isolate the rightmost 0-bit	$x = \sim x \& (x + 1);$	0b01110111	0b00001000
Turn on the rightmost 0-bit.	$x = x (x + 1);$	0b01110111	0b01111111
Right propagate the rightmost 0-bit	$x = x \& (x + 1);$	0b01110111	0b01110000
Multiply by 2	$x \ll= 1;$	0b00000010	0b00000100
Divide by 2	$x \gg= 1;$	0b00000010	0b00000001
XOR swap	$a \wedge= b; b \wedge= a; a \wedge= b;$		
Calculate 2^n	$1 \ll n;$		
Convert letter to lowercase	$x = (x '');$	A	a
Convert letter to uppercase	$x = (x \& '_');$	a	A
Swap Nibbles	$x = (x \ll 4) (x \gg 4);$	0b11110000	0b00001111

