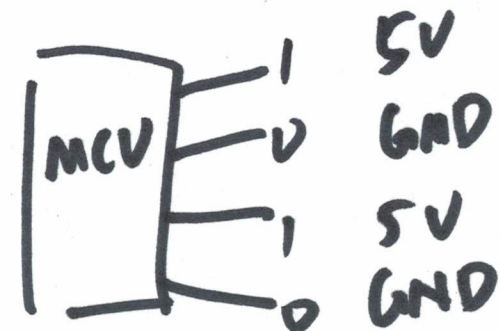


1 → 5V

0 → 0V GND

2's complement
negative numbers



0101 5

1010

+

1011 -5

↓ +3
-8 -5

11111111
-8 + 7 = -1

decimal

hex representation

Binary	hex representation
0b1010	0xA 10 unsigned
0b1010	0xA -6 signed
0b1100	0xC -4 signed

①

overflow $\neq$ carryout

$$\boxed{\begin{array}{r} P \\ + P \\ \hline N \end{array} \quad \begin{array}{r} N \\ + N \\ \hline P \end{array}}$$

$$\begin{array}{r} 111 \\ + 011 \\ \hline 01010 \\ N \end{array} \quad \begin{array}{l} N \\ P \\ +3 \\ +2 \end{array}$$

$$\begin{array}{r} 1111 \\ + 1100 \\ \hline 1011 \\ -8 \end{array} \quad \begin{array}{l} -1 \\ N -4 \text{ overflow} \\ P -5 \text{ carries} \\ +3 = -5 \end{array}$$

$$\begin{array}{r} 111 \\ + 101 \\ \hline 100 \end{array}$$

$$\begin{array}{r} 011 \\ + 011 \\ \hline 0110 \\ - \end{array} \quad \begin{array}{l} P +3 \\ P +3 \\ N +6 \end{array}$$

(2)

bit-wise
and

0X FF 00

↓ ↓ ↓

|||| ||| 0000 0000

reset lower byte

105.7°C and

True && False

= False

$$\circ \quad 221 = 0$$

③

1 bit-wise or
11 ~~logic~~ or

0x ABC <u>D</u>	keep lower byte unchanged see upper byte
1 0x FF 00	
0x FF CD	

~ bit wise NOT

!= logic NOT