9's 1's
10's 2's

Unsigned → 10101011 → Sign X
→ data
→ magnitude

+10 → +20
(-10) (-20)

Signed → 0 | 101011 | +ve
msb
Sign magnitude

(+) → 0
(-) → 1

S | 1 | data
8bit
Signed
data
unsigned

1's Complement
2's Complement

S	Unsigned	S.N	1's	2's
0 0 0	0	+0	+0	+0
0 0 1	1	+1	+1	+1
0 1 0	2	+2	+2	+2
0 1 1	3	+3	+3	+3
1 0 0	4	-0	-3	-4
1 0 1	5	-1	-2	-3
1 1 0	6	-2	-1	-2
1 1 1	7	-3	-0	-1

0 → +ve
1 → -ve

(+)
(-)

-1 → 1 → 001 → 111
-2 → 010 → 110

3 bit Unsigned → 0 ↔ 7
0 ↔ $2^n - 1$
→ 0 ↔ $2^3 - 1$
→ 0 ↔ 7

8
0 7

3 bit Signed → - ↔ 0
→ 0 ↔ +
-3 ↔ (-0)
0 ↔ (3)

4 bit Signed → -7 ↔ (-0)
→ (+0) ↔ (7)

Rang $-(2^{n-1}-1)$ to $+(2^{n-1}-1)$

n → +, -
2^n → $+2^{n-1}$, -2^{n-1}
2

1's Complement → $-(2^{n-1}-1)$ to $(2^{n-1}-1)$
↳ +1 add
↳ + Usual

2's Complement $-(2^{n-1})$ to $(2^{n-1}-1)$

$\Rightarrow$ $-(2^{n-1})$ to $(2^{n-1}-1)$

C $\Rightarrow$ int $\Rightarrow$ Signed $\Rightarrow -(2^{n-1})$ to $(2^{n-1}-1)$

char $\Rightarrow$ $-(2^{7-1})$ (6 bit to 31)

(-29) represent bit 2's

$-(2^{n-1}) \leq -28$

$2^{n-1} \geq 28$

$n-1 \geq 4.7$

$n \geq \lceil 5.7 \rceil$

$n \geq 6$

-32 (4 bit) $\rightarrow -8$

$-(2^{n-1})$

$-(2^{n-1})$