Week 3 : Lecture 2

How to deal with negative Hs?

① Comp does know +, −

it only knows 0, 1

(2) The left most bit is the sign bit

0 → +ve

1 → (-ve) Negative

③ What is the ~~x/s~~ meaning of negative #s?

$+a \longrightarrow (+6)$

$x = [\text{negative } a]$

$x + a = 0$

$(101)_2 = 5$

$010 + 1 = (011)_2$

↓

2's c. of 101

$-5 = 1011$

$+5 = 0101$

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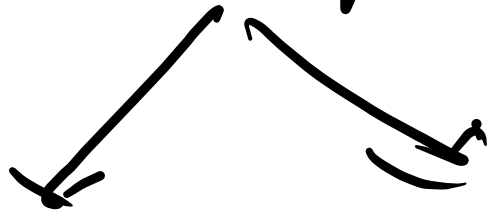
8 bit 'signed' # system

10001

I will define my number system



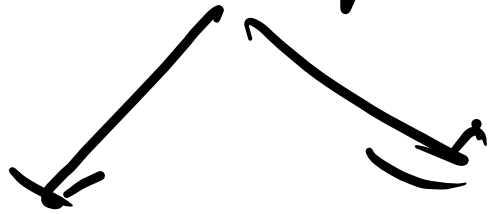
Unsigned

+17

Signed ?

10001

I will define my number system



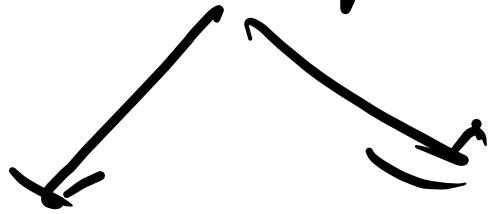
Unsigned

+17

Signed ?

10001

I will define my number system



Unsigned

+17

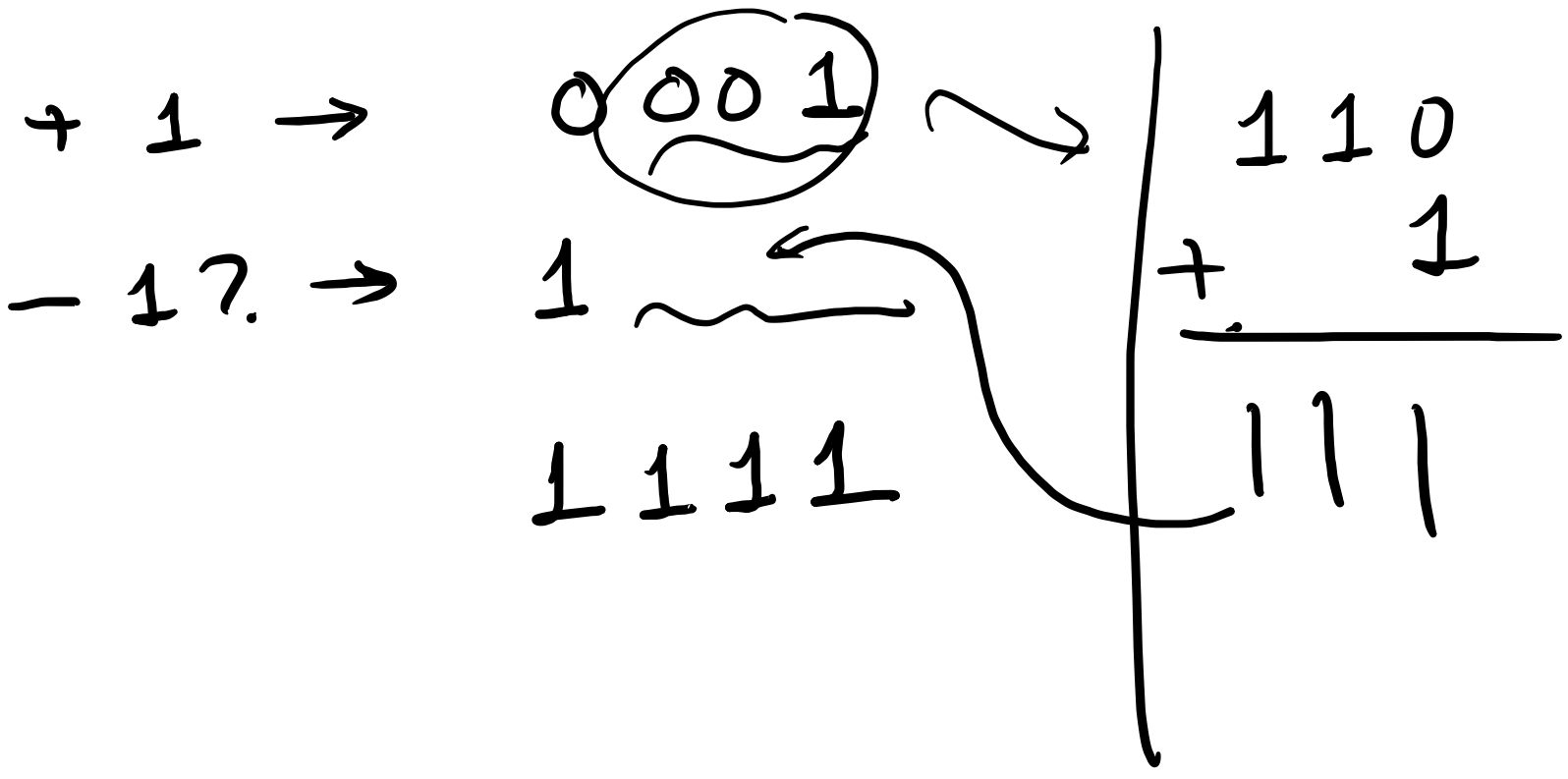
Signed ?

Signed:

Signed magnitude	Signed Complement System
0101 = +5	
0111 = +7	
1111 = -7	

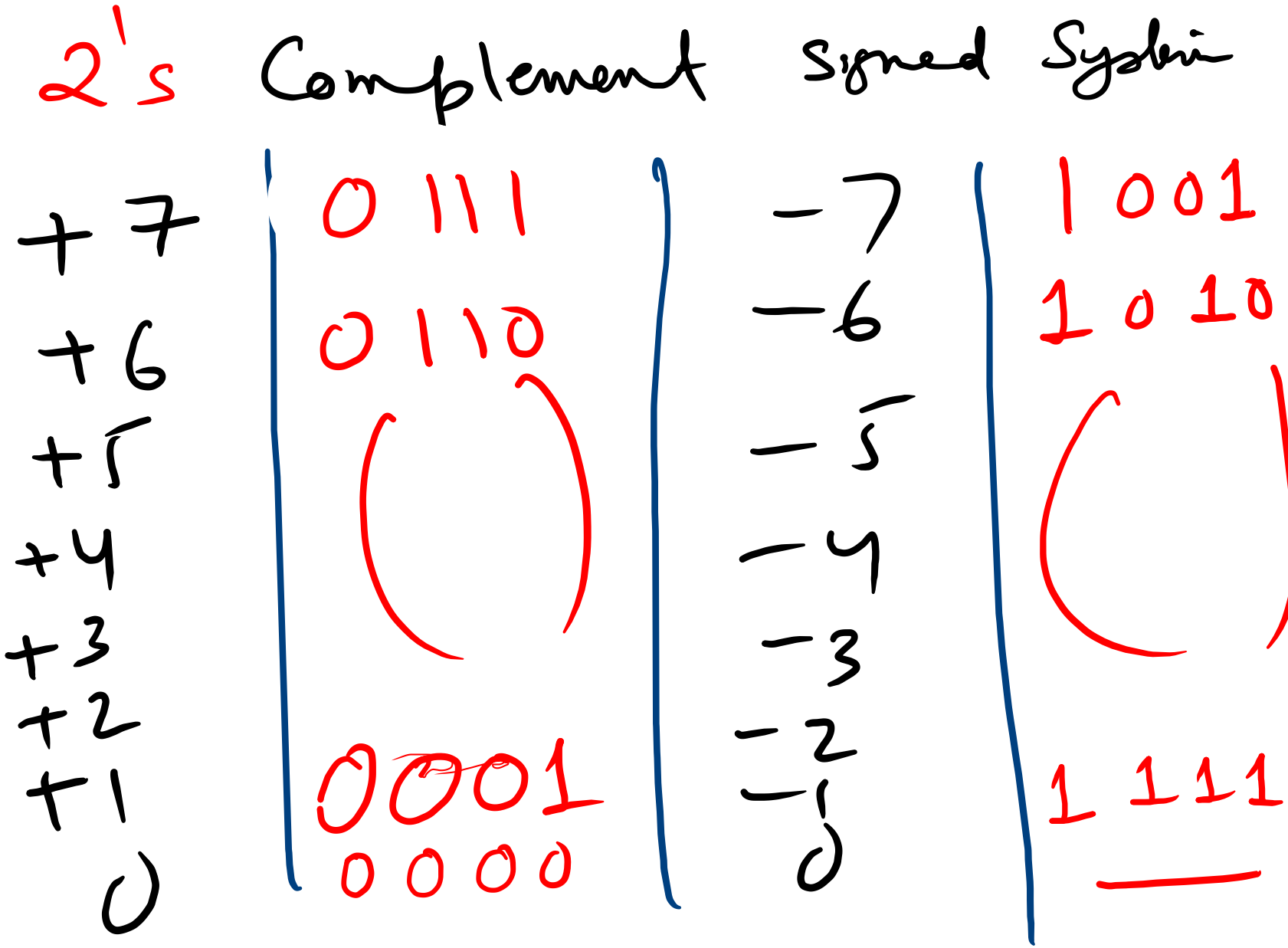
Signed magnitude		System	
+7	0111	−7	
+6	0110	−6	
+5	0101	−5	
+4	0100	−4	
+3	0011	−3	
+2	0010	−2	
+1	0001	−1	1001
0	0000		

Signed 2's Complement system



$+2 \rightarrow 0010$

$-2 \rightarrow 1110$


2's Complement
Signed Sysbm
+7
+6
+5
+4
+3
+2
+1
0
0111
0110
0001
0000
-7
-6
-5
-4
-3
-2
-1
0
1001
1010
1111

-8 → $-7 \rightarrow 1001$

$+1$

$-8 \quad 1000$

$-7-1 = -8$

$(1001) - (0001) = \underset{-8}{1000}$

Suppose 9 have

4 bits + 1

$\underline{1}\ \underline{0}\ \underline{0}\ \underline{0}\ \underline{0} \rightarrow (-16)$

$\uparrow\ (-8) \neq 01000$