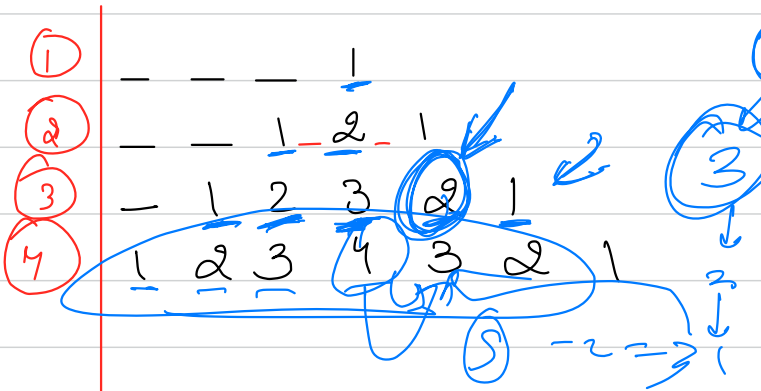
↳ Agenda → Problem Solving → Loops, if/else

Discuss storage of -ve no.

Pattern



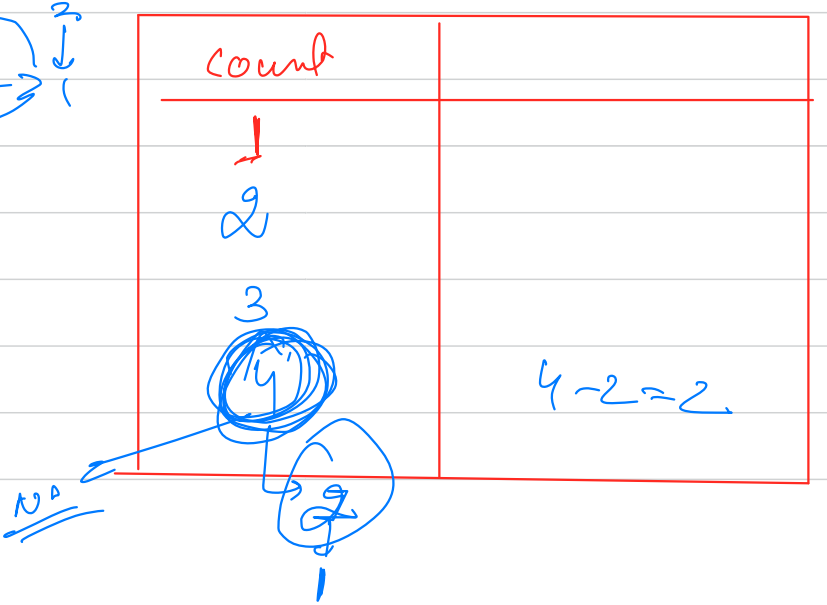
flow have spaces btw integers

n = 4

for row = 3

Display → 1 2 3

count = 1



cats and dogs

C → cats

D → dogs

l → legs

if the no. of legs is not a multiple of 4 → NO

y = C + D → total animals

legs/4 → no. of animals whose feet touch the ground

g = y − legs/4 → animals whose feet do not touch the ground

Cats

if $\hat{y} \geq 0$ and $\hat{y} \leq \min(cats, 2*dogs)$

$y=6$ $\min(6, 2*9)$ $6 \leq 4$ NO

if dogs puts cat on mem back with max capacity

→ $2*dogs$ → max cats that can ride on m dogs

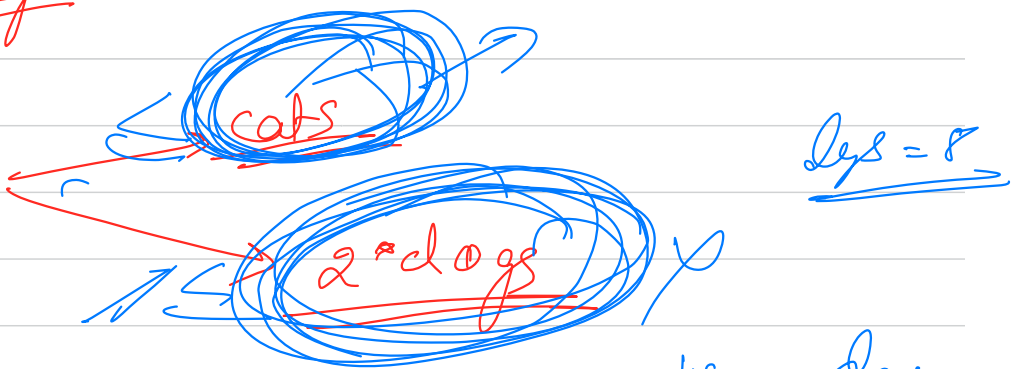
$8-2$

$\Rightarrow 6$

cats

dogs

$\hat{y}$



dys = 8

cats < dogs

2 < 4

cats > dogs

4 > 2

cats > dgs

6 2

$C > D$ → at max how many cats can ride?

↳ $2*d$

$C < d$ → at max how many cats can ride? → C

$y \leq \min(C, 2*d)$

$y < C < 2*d$

$y < 2*d < C$

forced no cats ride y ✓

$2*d < C$

→ Armstrong no → If is a number which is equal to the sum of cubes of it's digit (no is ≤ 999)

1 5 3

↓ ↓ ↓

1 + 125 + 27 → 126 + 27 → 153

↳ Given a number n, check if this is a n-narcissistic number or not.

Ex → 1634 → 4 digits

$1^4 + 6^4 + 3^4 + 4^4 \rightarrow 1634$

$n \leq 10^{18}$

num = "1634"

no_of_digits = 4

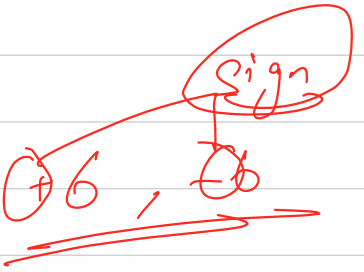
num = 1634 → 163 → 16 → 1 → 0

original_num = 1634

temp = 0 + 256 + 81 + 6 + 1 ⇒ = 1634 yes

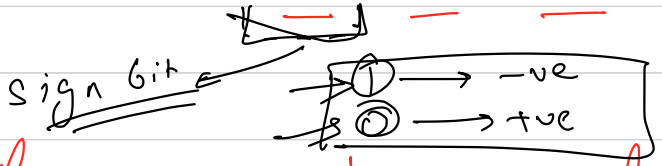
digit = ~~4~~ ~~3~~ ~~2~~ 1

016 → 16



↳ How negatives are stored ??

thought



By using sign we distinguish between +ve & -ve no.

How Been shown -ve

MSB

sign bit

-ve

+ve

2^3

at each bit we can have 0 or 1

on off

1 0 0 0 0

+ve

-S

S

How to rectify it??

Binary System — 0, 1

→ 2's complement

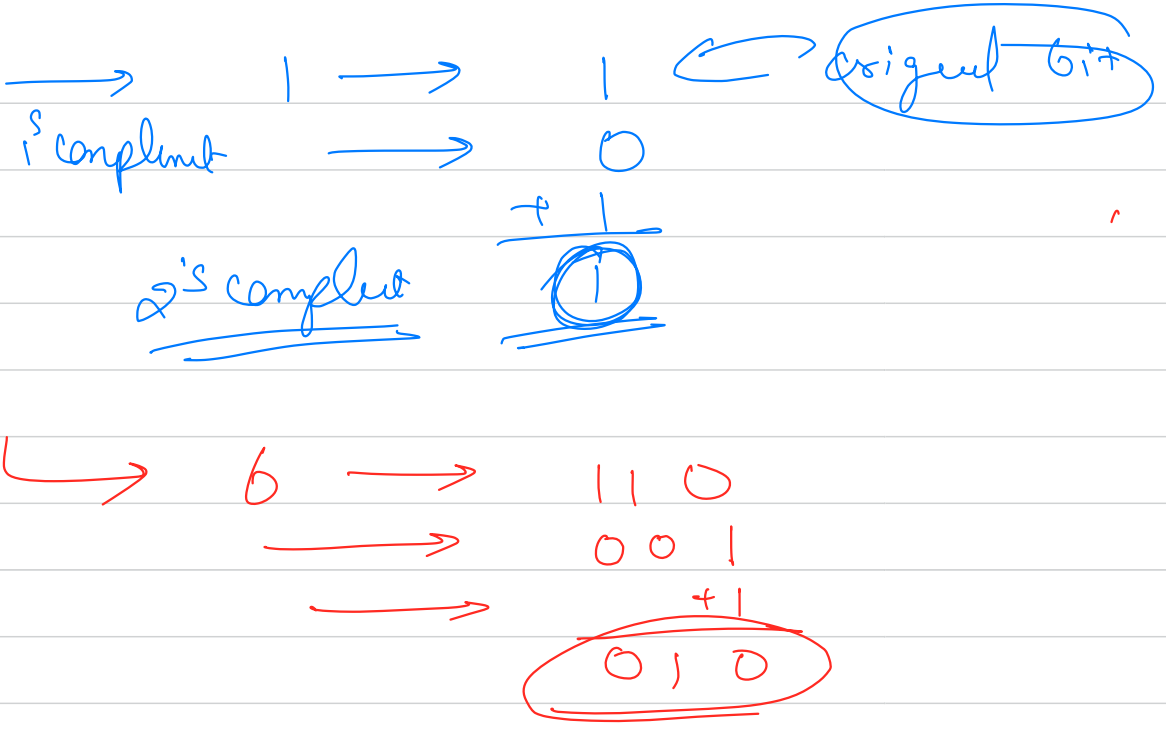
S → 1 0 1

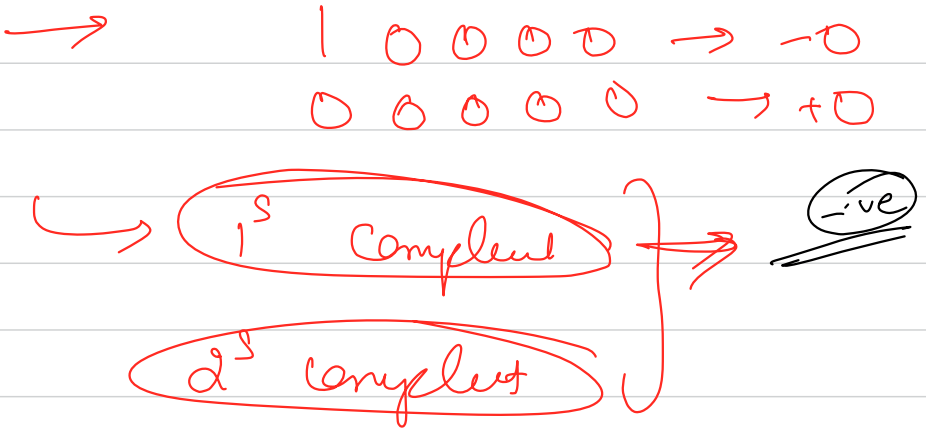
→ 1's complent → 0 1 0 → inverting the bits

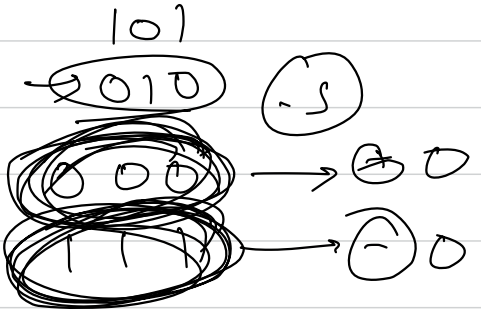
→ 2's complent → 0 1 1 (+1) → −S

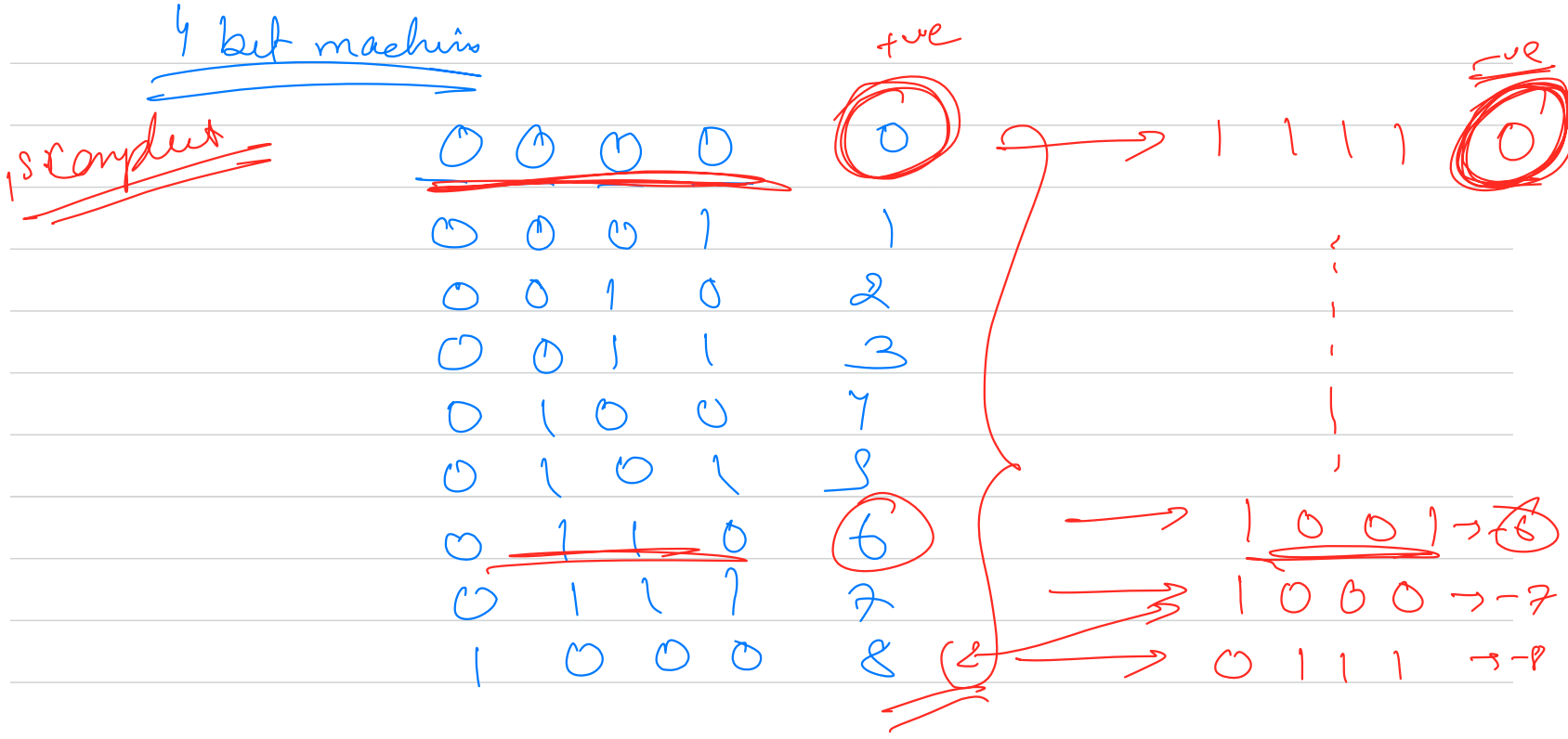
0 + 0 → 0
1 + 0 → 1
0 + 1 → 1
1 + 1 → 10

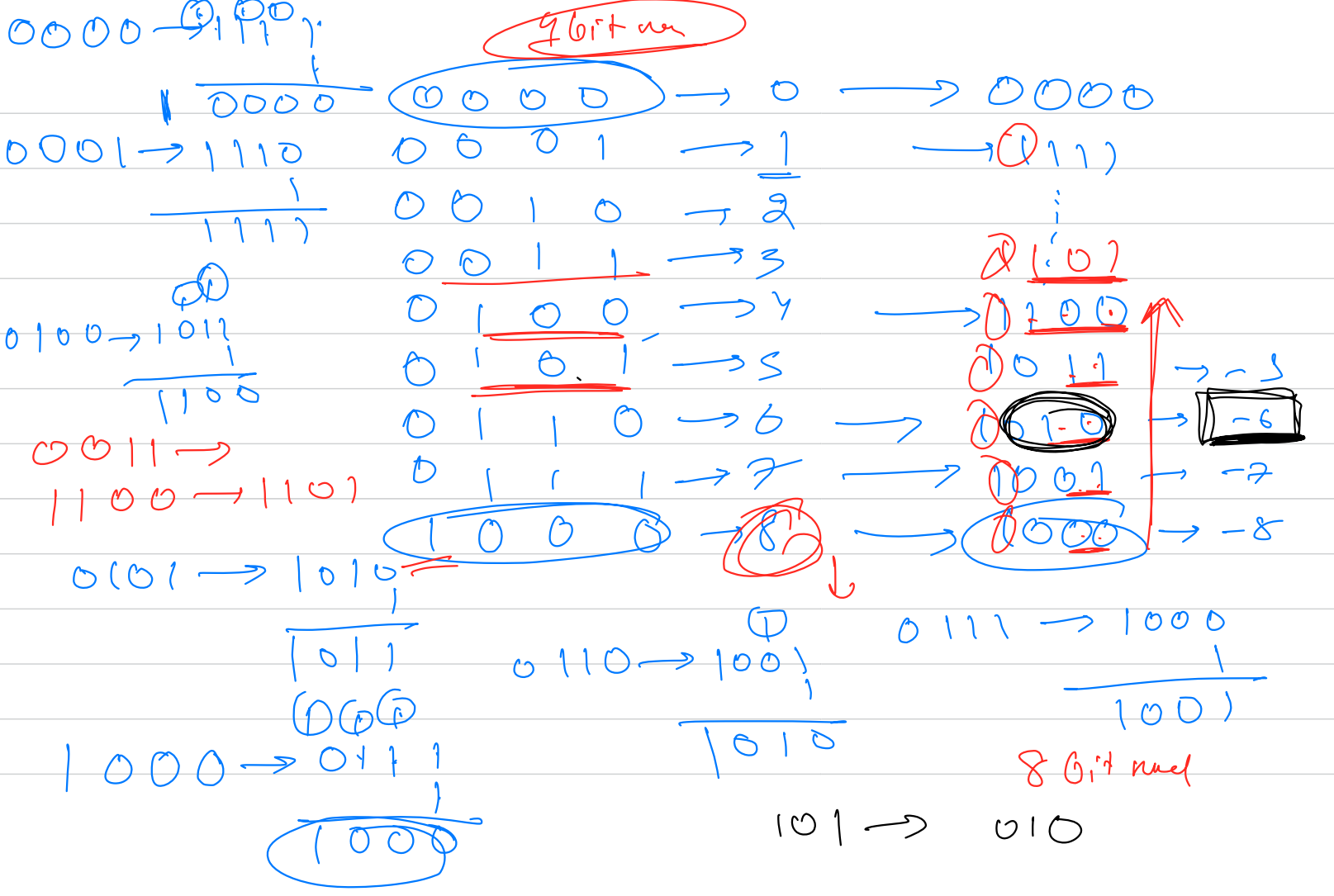
} binary add

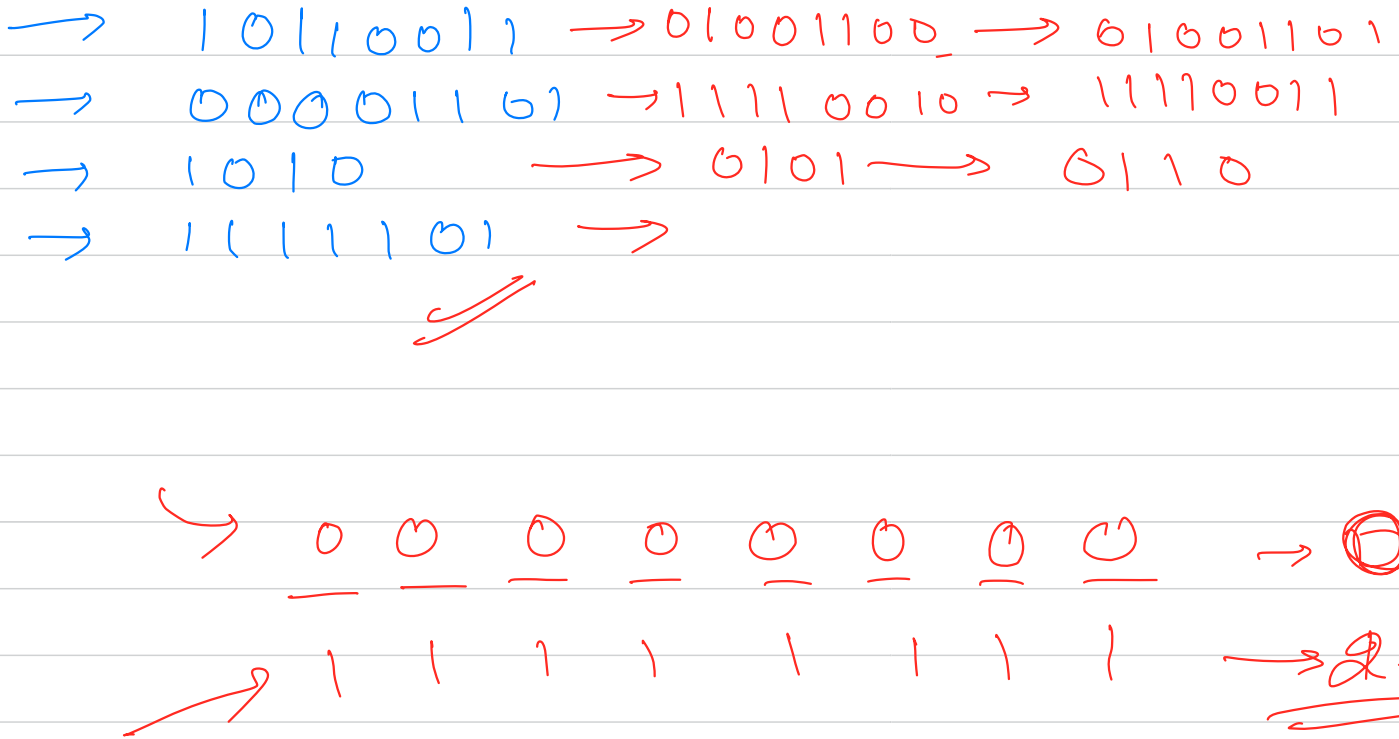

1
1
sign bit
1's complement
0
+ 1
2's complement
1
6
110
001
+1
010

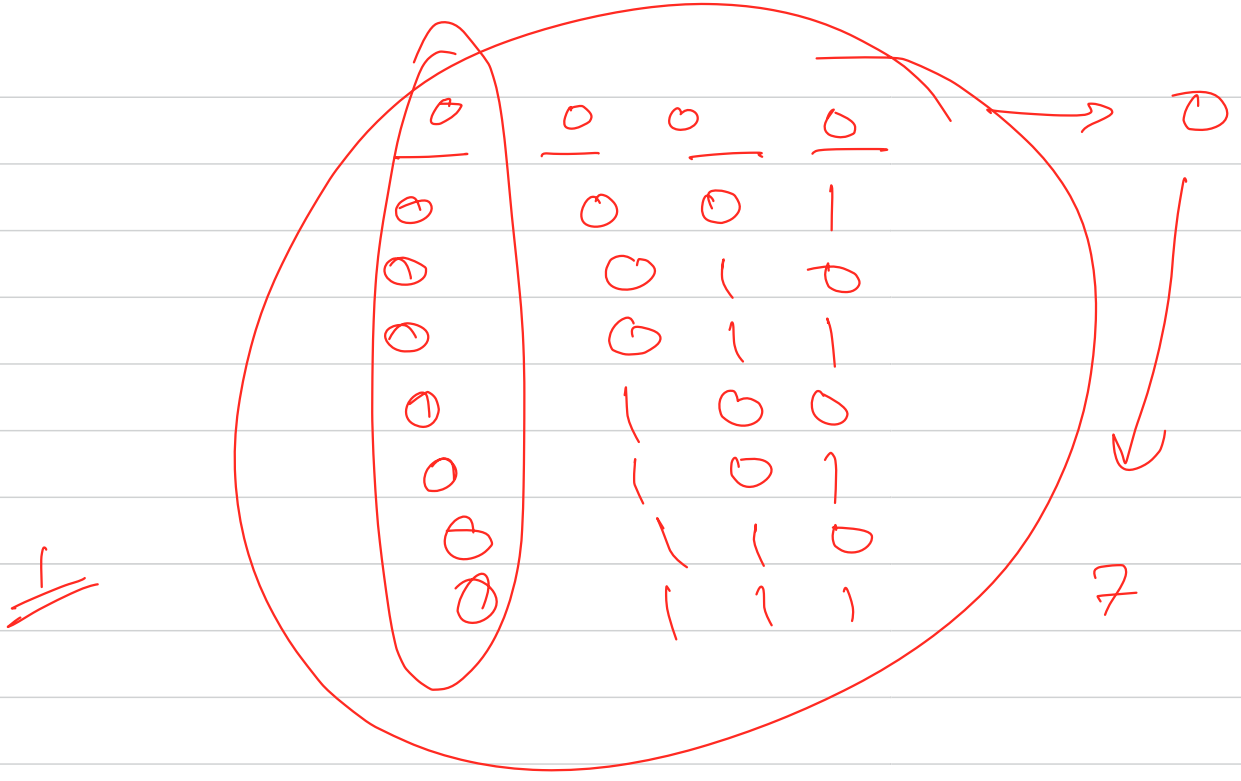

1 0 0 0 0
0 0 0 0 0
1's complement
2's complement
-ve


101
010
-5


4 bit machine
1's complement
+ve
-ve
0 0 0 0 0
0 0 0 1 1
0 0 1 0 2
0 0 1 1 3
0 1 0 0 4
0 1 0 1 5
0 1 1 0 6
0 1 1 1 7
1 0 0 0 8
1 1 1 1 -0
1 0 0 1 -6
1 0 0 0 -7
0 1 1 1 -8


4 Bit rep
8 Bit rep
0000 → 0 → 0000
0001 → 1 → 0001
0010 → 2
0011 → 3
0100 → 4
0101 → 5
0110 → 6
0111 → 7
1000 → 8
1000 → -8
0111 → -7
0110 → -6
0101 → -5
0100 → 4
0011 → 3
0010 → 2
0001 → 1
0000 → 0
1111 → -1
1110 → -2
1101 → -3
1100 → -4
1011 → -5
1010 → -6
1001 → -7
1000 → -8
0111 → 0111
0110 → 0110
0101 → 0101
0100 → 0100
0011 → 0011
0010 → 0010
0001 → 0001
0000 → 0000
1111 → 1111
1110 → 1110
1101 → 1101
1100 → 1100
1011 → 1011
1010 → 1010
1001 → 1001
1000 → 1000
101 → 010




0 0 0 0
0 0 1
0 1 0
0 1 1
1 0 0
1 0 1
1 1 0
1 1 1
Z

→ 8 bits

+8

-ve
2's comp

1 1 1 → 7

8 bit mach

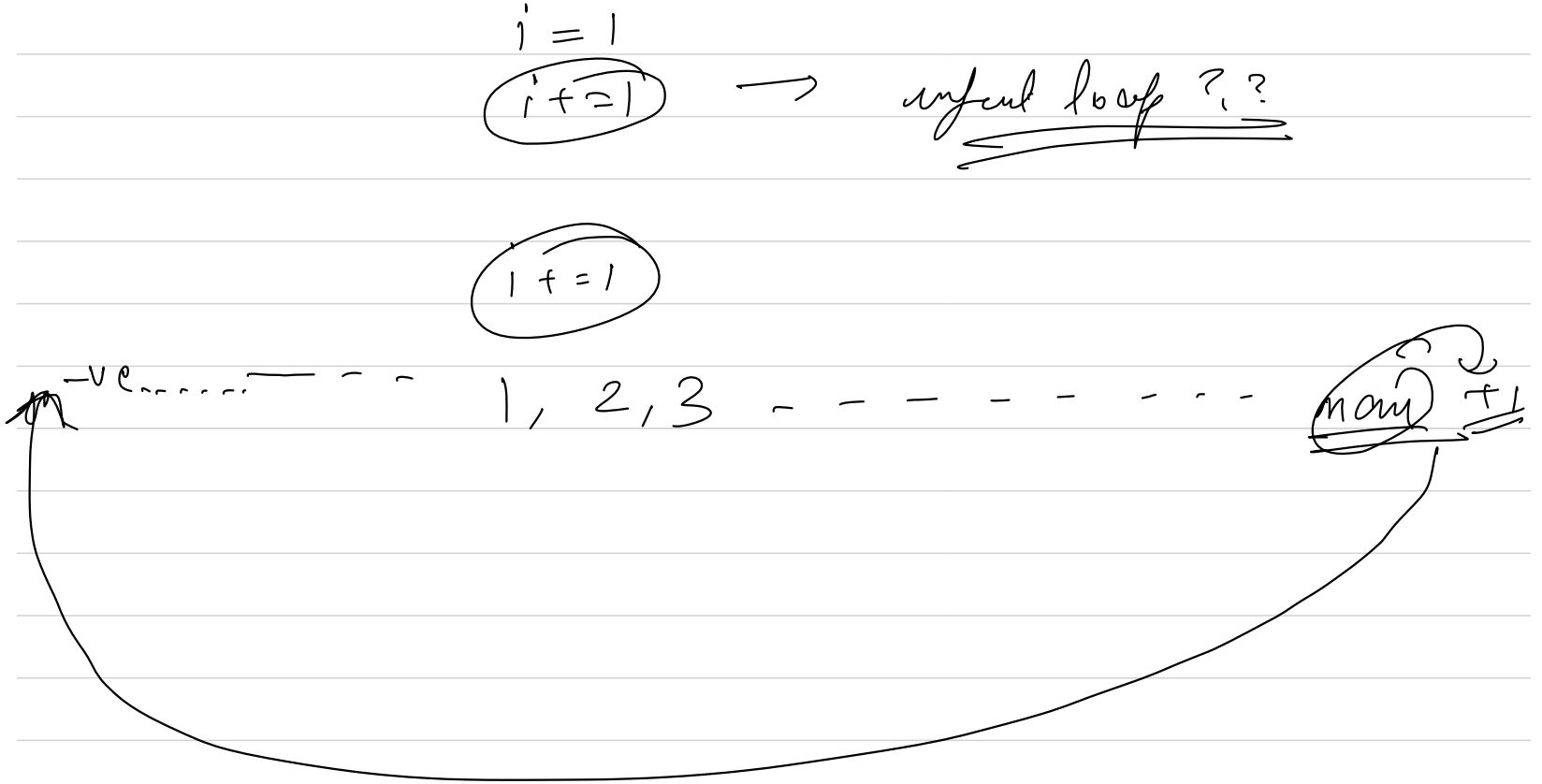
if we have a n bit machine

the range of no. is

$$-2^{n-1} \quad \text{to} \quad +(2^{n-1}-1)$$

-2^{n-1} → lower limit

$+(2^{n-1}-1)$ → upper limit


i = 1
i += 1
infinite loop ??
i += 1
-ve
1, 2, 3
max
+1