

8  
↓  
1000

7  
↘  
110

9  
↘  
1001  
& 1  
-----  
0001

number & 1 → 1 → odd

1 <<< 2

4 → 2<sup>2</sup>

0 0 0 0 |

→

0 0 0 | 0 0

4 >> 1

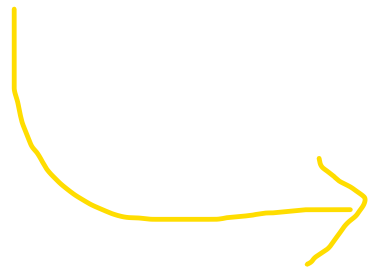
→

1 0 0

10

$$1^{\wedge}3 = 2$$

$$A^{\wedge}A$$



0 0 1



1



0

2

^

0 1 1



3



0 1 0



1 \_ \_ n (n=4)

$$\text{XOR} = 1 \wedge 2 \wedge 3 \wedge 4$$

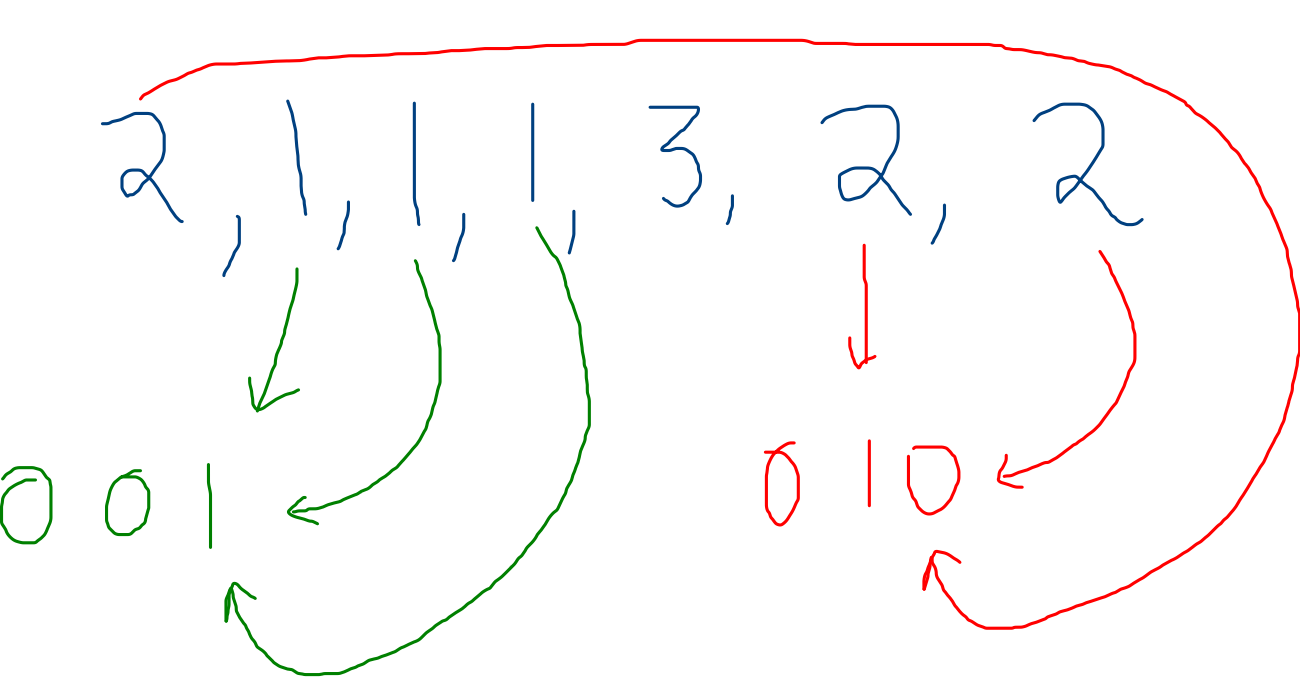
XOR n

Repeated  
one

Extra  
number

[1, 3, 4, 2, 2]

$$\rightarrow 1 \wedge 3 \wedge 4 \wedge 2 \wedge 2$$



4	4	0	0
0	1	2	3

1	1	0	0
0	1	2	3

$$1 \rightarrow \begin{bmatrix} 0 & 0 & 1 \\ 0 & 0 & 1 \\ 0 & 0 & 1 \end{bmatrix}$$

$$2 \rightarrow \begin{bmatrix} 0 & 1 & 0 \\ 0 & 1 & 0 \\ 0 & 1 & 0 \end{bmatrix}$$

% 3

0 1 1

1<sup>st</sup> 0<sup>th</sup>

4 → 100  
↓  
2<sup>nd</sup>

10, 10, 10, 2, 2, 2, 4

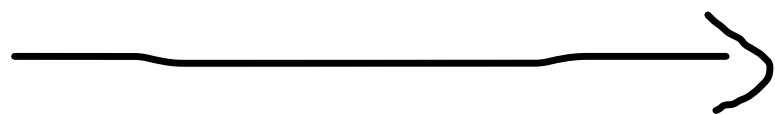
1<sup>st</sup>  
↑  
2 → 10

10 10  
3 2 1 0

% 3

0	6	1	3
0	1	2	3

0	0	1	0
0	1	2	3



$-4, -1, -4, -5, 1, 1, 1, 2, 2, 2,$

33

0	1	2	3	-	-	-	31
4	3	4	0	0	0	0	4

-ve

32

sign

2<sup>nd</sup> 1<sup>st</sup> 0<sup>th</sup>

-4 → 4 →

(100)

2<sup>nd</sup>

-5 → 5 →

101

0<sup>th</sup>

1 → 001

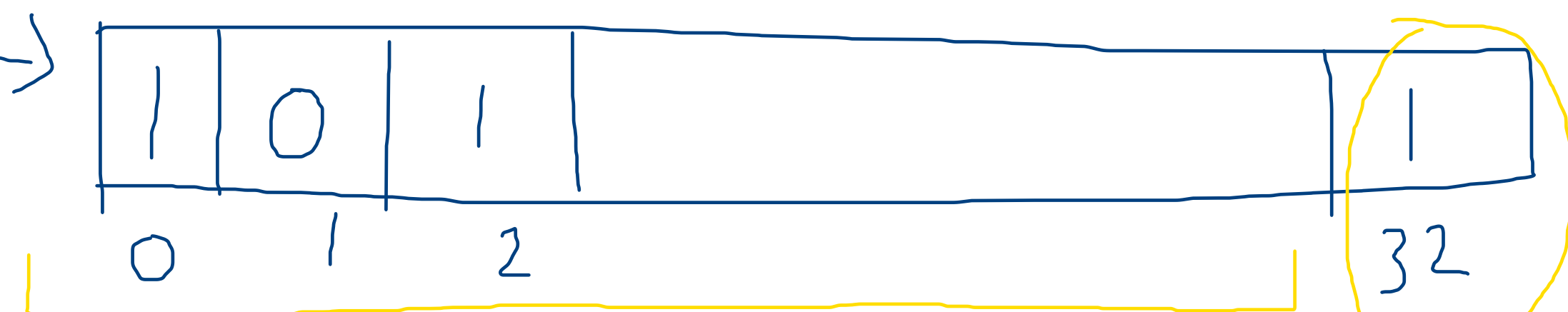
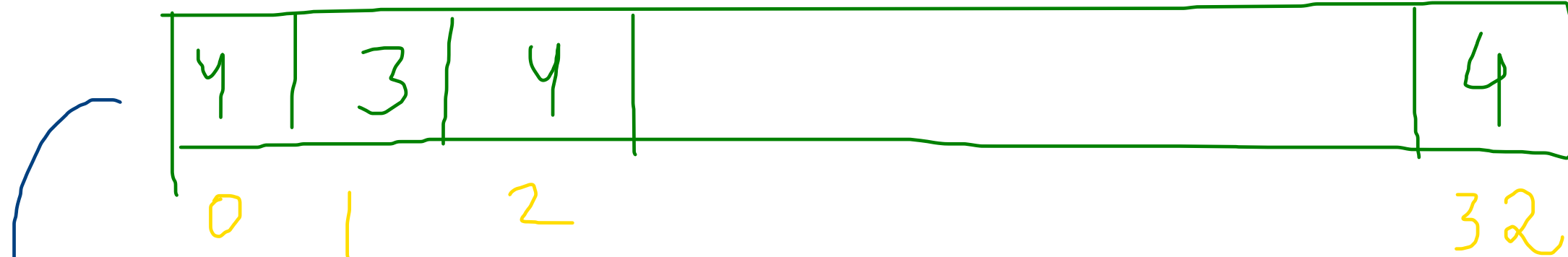
1<sup>st</sup>

0<sup>th</sup>

2 → 010



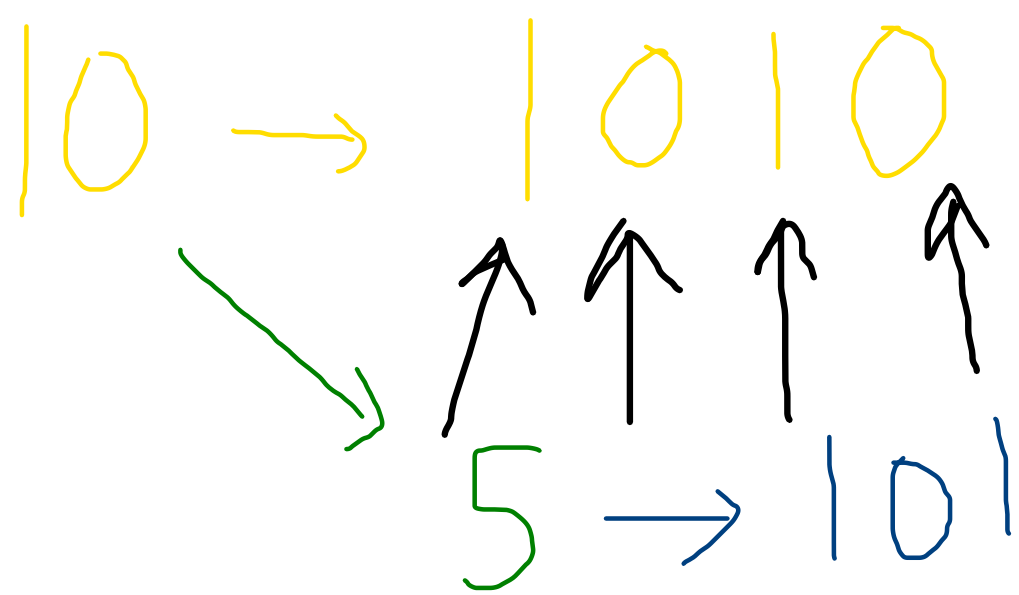
0/03



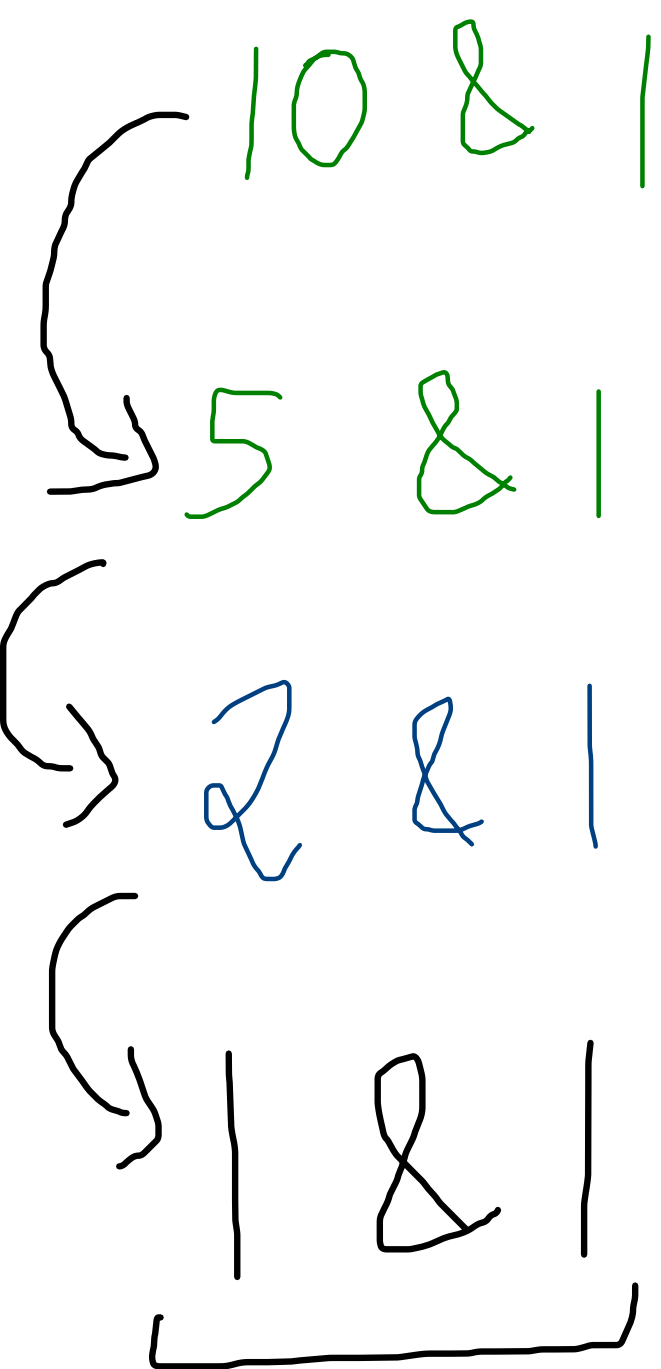
$$2^0 + 2^2 = \textcircled{5}$$

Integer

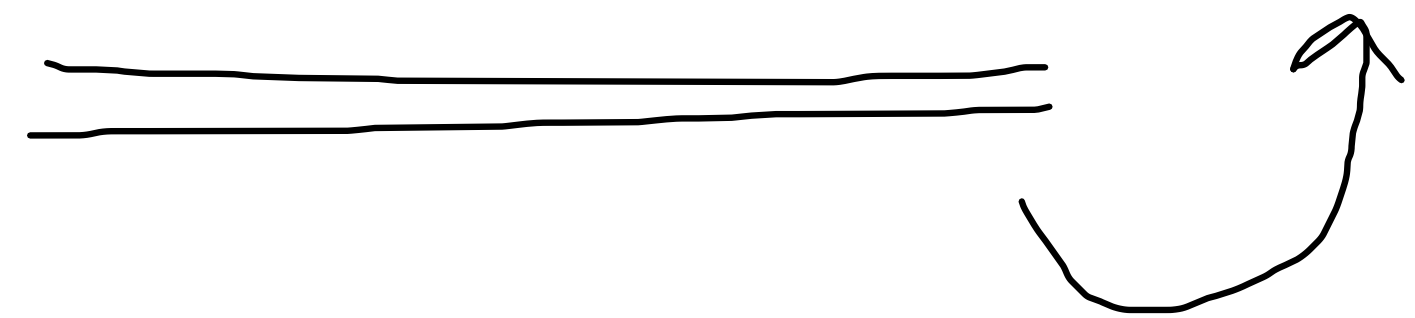
-ve



0  
1  
2  
3



0	1	2	3
0	1	0	1



9 → 1001<sub>32010</sub>

9Δ1 → 1

9&8 → 18

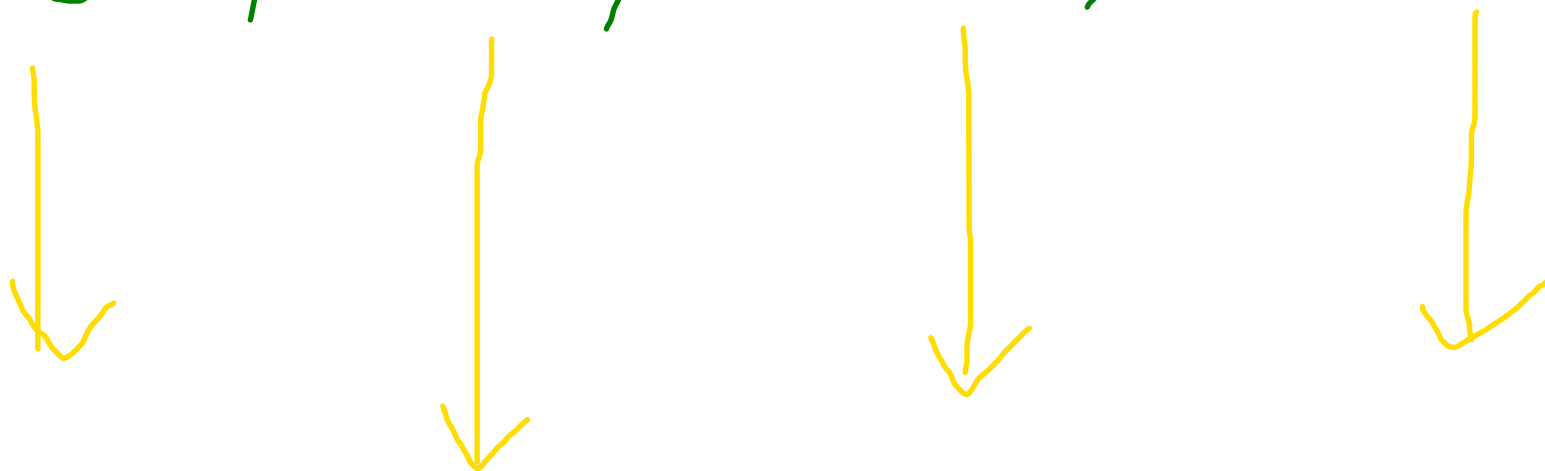
9&8 → 8

9&1 → 1

9&2 → 0

9&4 → 0

[0, 1, 3, 2]



00 01 11 10

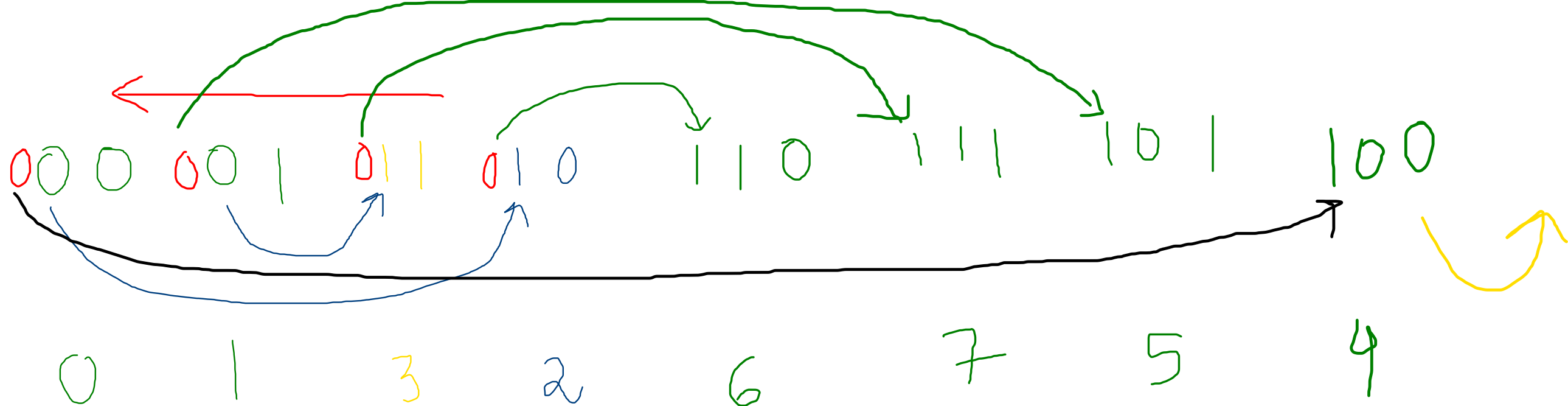


n=2



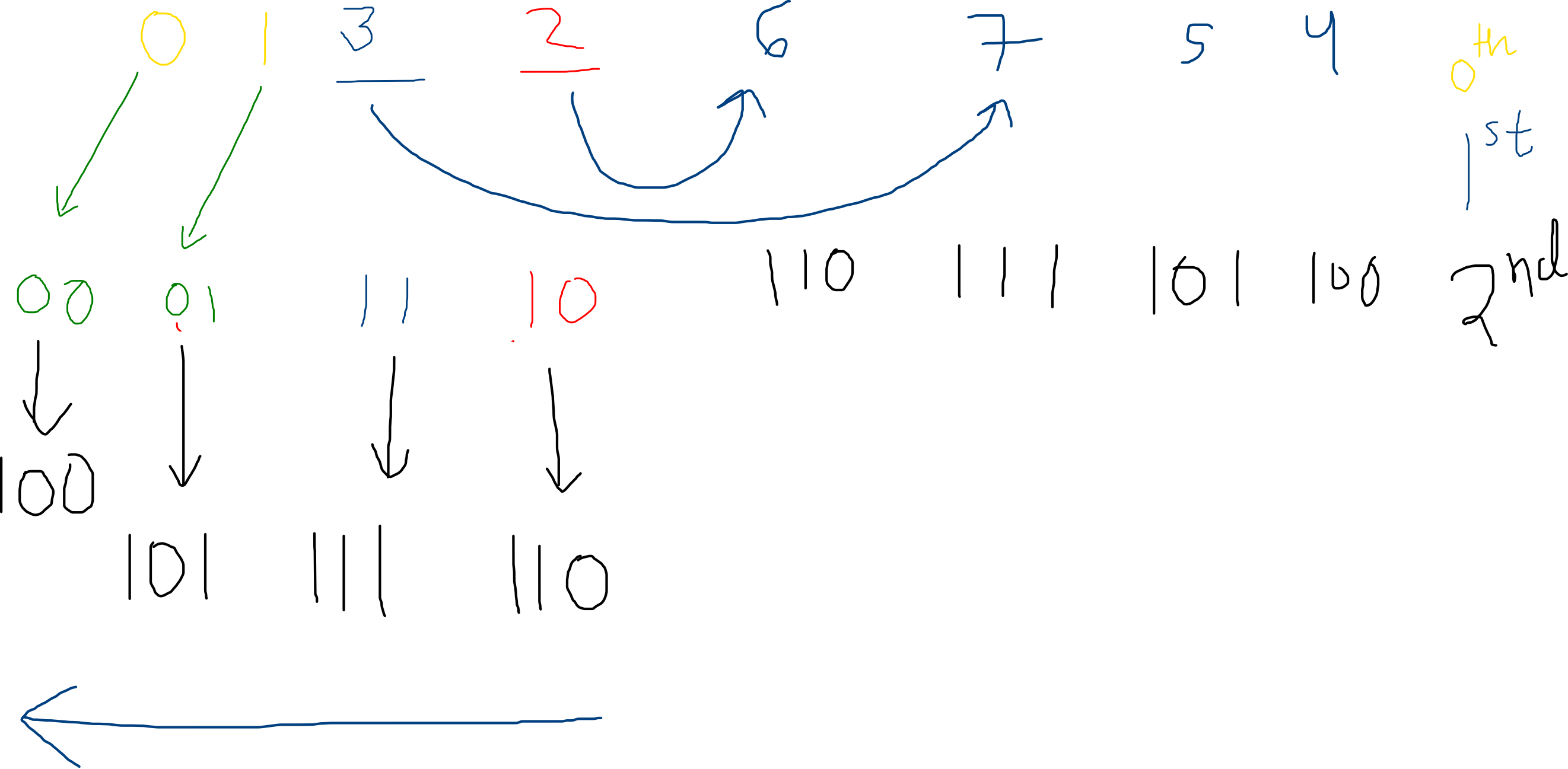
$2^2$

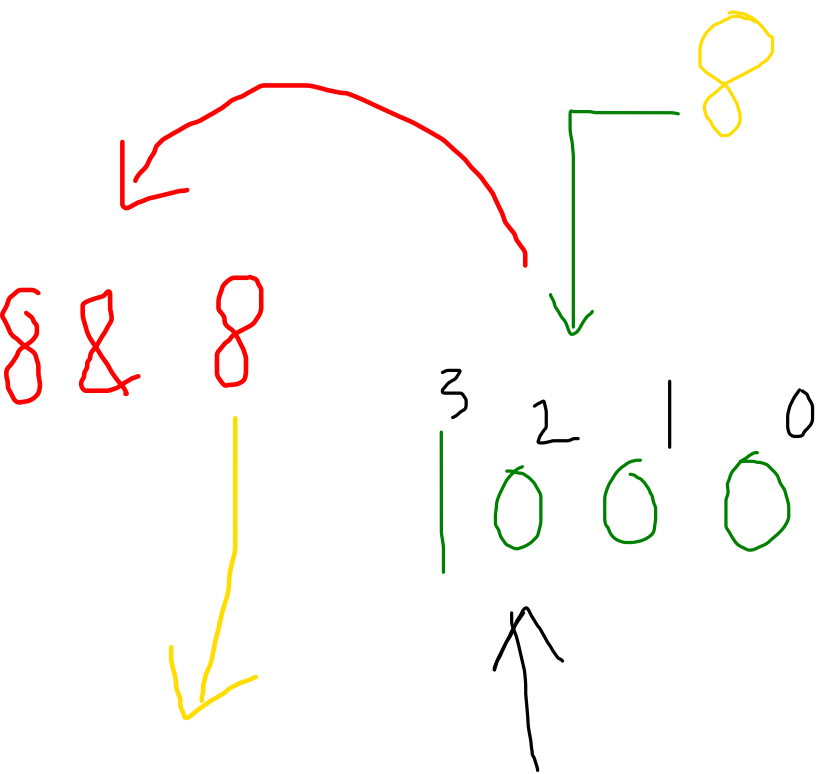
$0 - 2^2 - 1$



4 → 106

4 | (1 << 1) → 6





2<sup>nd</sup>

8 | (1 << 2)

100

$n = 1$

<< 2

001

~~1 << 3~~  
2

1	1000
1	100
<hr/>	
11	00

abcde**a**fgb

↓  
0

a → 0

b → 1

c → 2

d → 3

z → 25

0

→

0

(a-z)

4 3 2 1 0  
~~0~~ ~~0~~ ~~0~~ ~~0~~ ~~0~~  
| | | | |

'a'  
//



'a' → 0<sup>th</sup> with 1

'e' → 4<sup>th</sup> with 1

'o' →

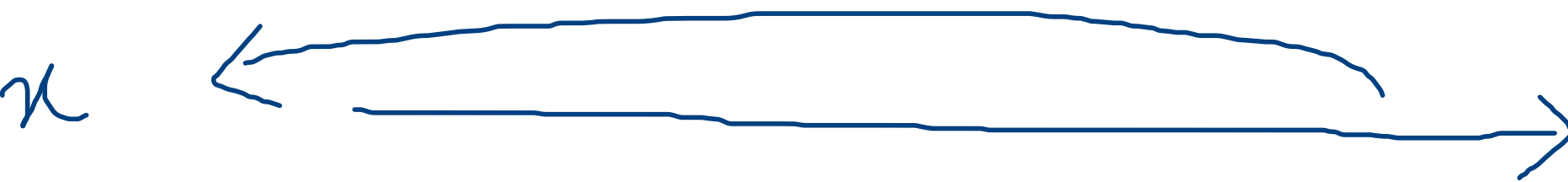
'u' →

'i' →

0000000000  
/ / / / /  
/ / / / /  
0 0 0  
└──┘

a e i i e a  
↑

↓  
even  
vowels  
present



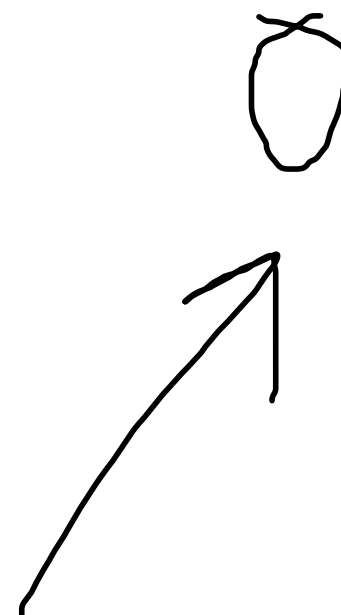
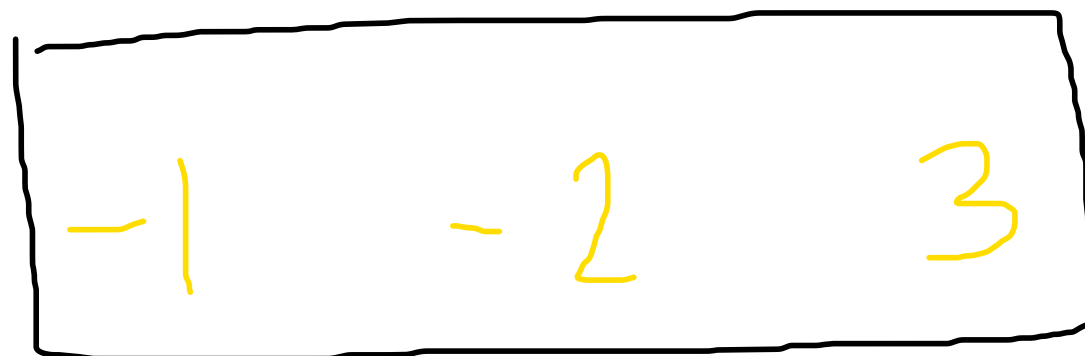
3

2

-1

-2

3



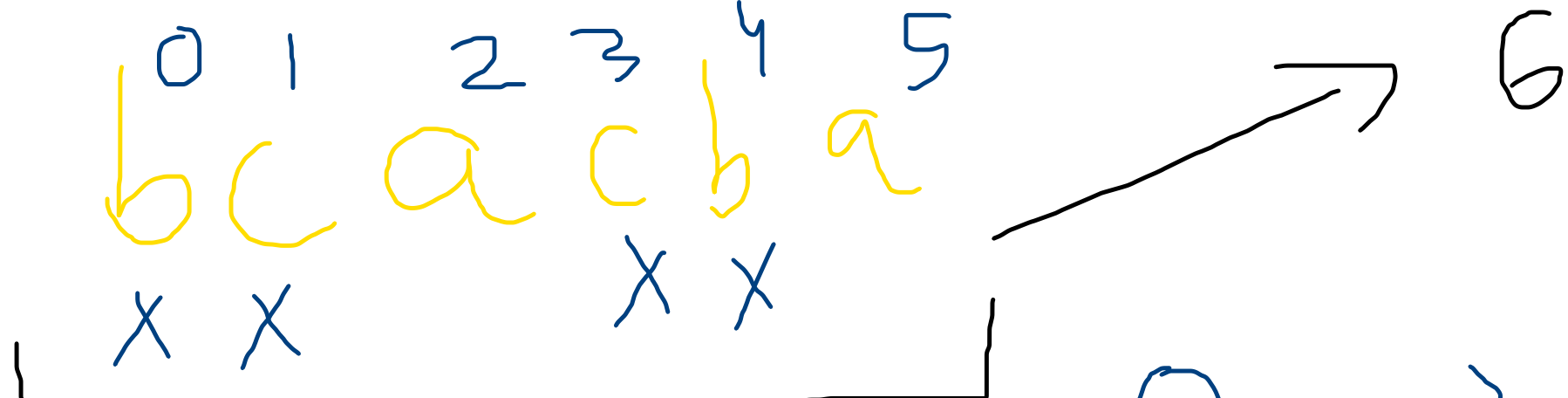
3

5

4

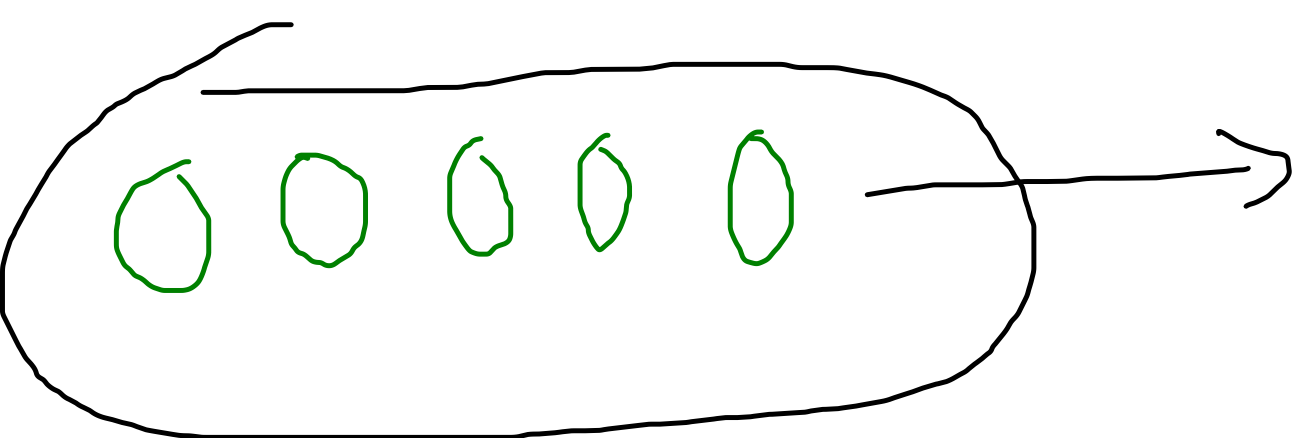
2

5



✓ 0 0 0 0 0 →

0 0 0 0 |



end ←  $5 - 0 + 1 \Rightarrow 6$

start

0 0 0 0 →

0 0 0 1  
| 0  
| 1

| | | | → 6