Q. Given a number x (any integer).

Count the values of a which satisfy the following:

$q \le 10^5$

$x \le 10^{10}$

$q = 1$

$x = 10$

$a \wedge x > x$

$0 < a < x$

ans → 5

You will get q queries of x.

$1 \wedge 10 = 11$

$4 \wedge 10 = 14$ $3 \wedge 10 = 13$

$5 \wedge 10 = 15$

$6 \wedge 10 = 12$

$a \wedge x > x$

$0 < a < x$

↳ $n \rightarrow 11100000$

$x \rightarrow 110\_\_\_\_\_$

a_1, a_2, a_3, a_4, a_5

always $m > n$

↳

10110010 1

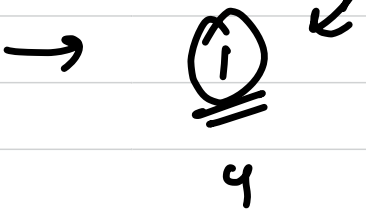
XOR

$x = 1110100110$

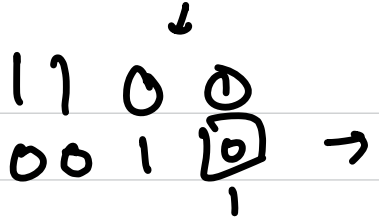
10

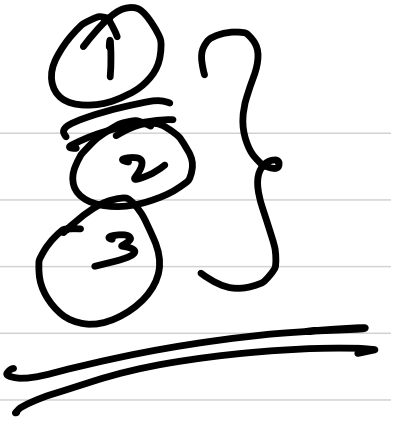
$x = 1010$

$2^0 \Rightarrow 1$



4




1
2
3

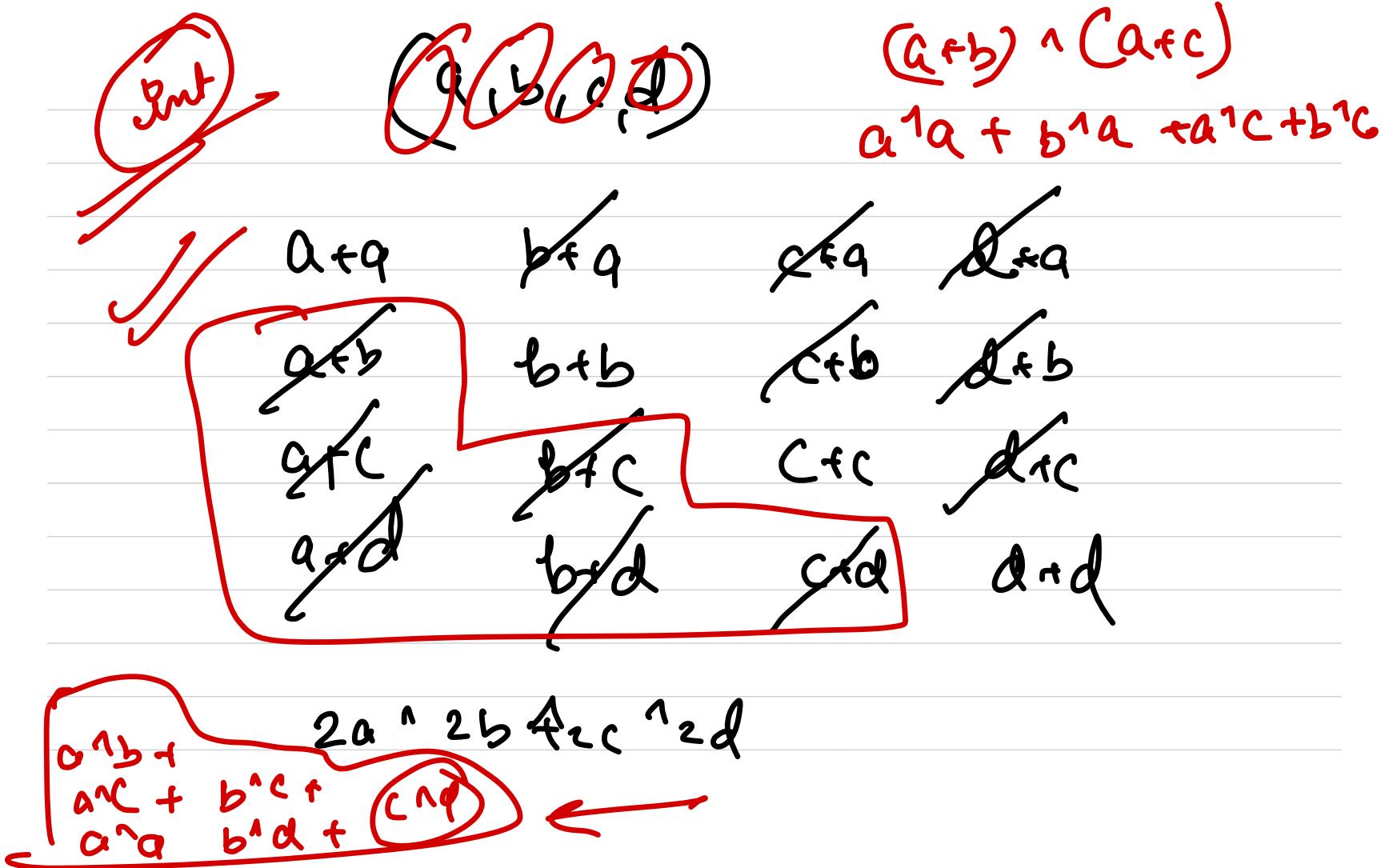
Q» Given an array, find the xor of sum of pairs in the array.

$[1, 2, 3, 4]$

ans → 8

$n \leq 10^5$

(a_i, a_j) (a_j, a_i)


Ent
(a,b,c,d)
(a+b) ^ (a+c)
a^a + b^a + a^c + b^c
a+a
b+a
c+a
d+a
a+b
b+b
c+b
d+b
a+c
b+c
c+c
d+c
a+d
b+d
c+d
d+d
2a ^ 2b ^ 2c ^ 2d
a^b +
a^c + b^c +
a^a b^d +
c^d

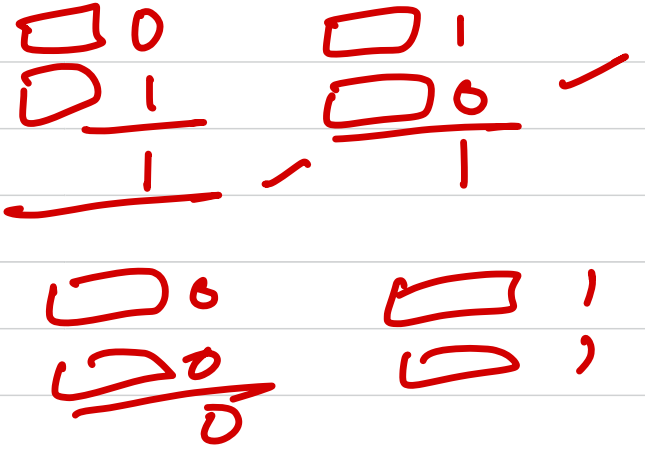
Study mode

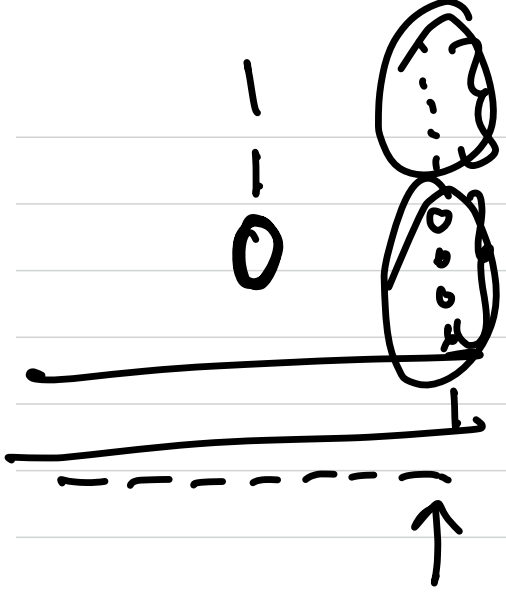
1, 2, 3, 4

01 10 11 100

1 → 2

0 → 2





7, 3, 5

Sum of xor

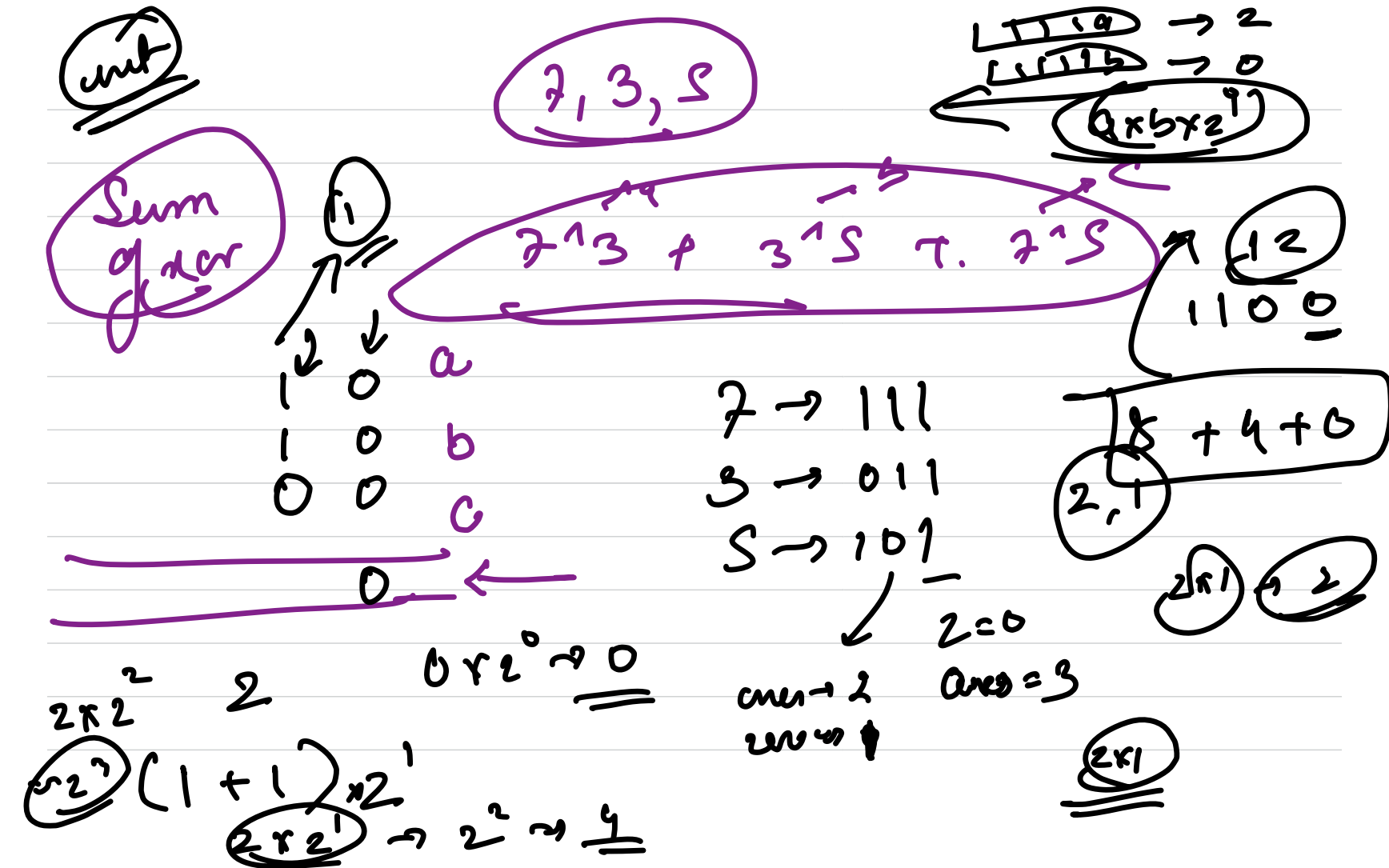
7 ^ 3 + 3 ^ 5 + 7 ^ 5

⇒ 4 + 6 + 2 = 12 → 1100

2

111 → 7
011 → 3
101 → 5

0


unit
7, 3, 5
Sum of xor
1
2
1 0 a
1 0 b
0 0 c
0
7 → 111
3 → 011
5 → 101
7^3 + 3^5 + 7^5
12
1100
8 + 4 + 0
2, 1
2x1 → 2
0x2^0 → 0
2x2^2
2
2x2^1
(1 + 1) x2^1
2x2^1 → 2^2 → 4
2=0
ans → 2
ans = 3
2x1

4 , 6 , 2

4 + 6 + 2

$(1\times2^2+0\times2^1+0\times2^0)$ $+(1\times2^2+1\times2^1+0\times2^0)$ $+(1\times2^1+0\times2^0)$

Q → [a, b, c, d]

twice

. except two

Subset

bit

[5, 2, 1, 3, 3, 1]

5 ^ 2 ^ 1 ^ 3 ^ 3 ^ 1 → 5 ^ 2 → 7

101

010

111

011

101

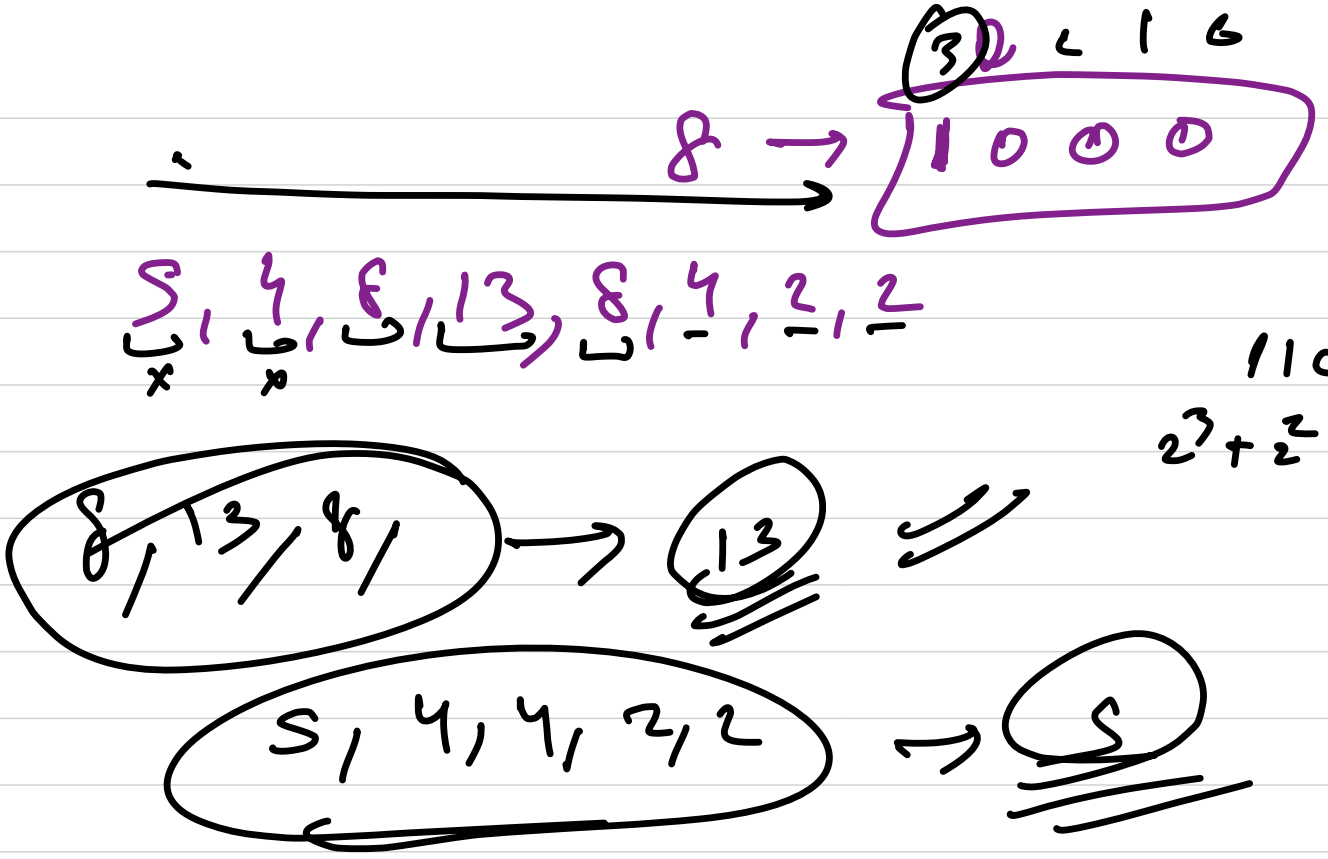
010

101 ← 5

010 ← 2

111

Set


3 2 1 0
8 → 1000
5, 4, 8, 13, 8, 4, 2, 2
1101
$2^3 + 2^2 + 1$
8, 13, 8,
13
5, 4, 4, 2, 2
5

$O(n)$

3, 4, 5

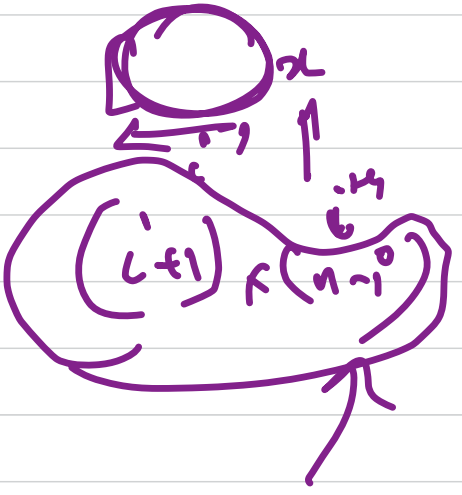
[3]
[4]
[5]
[3, 4]
[4, 5]
[3, 4, 5]

[3, 4, 5, 6]

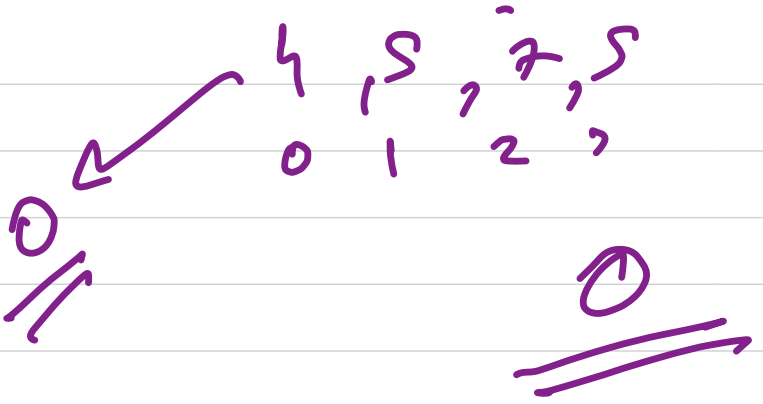
3
4
5
6

3 4
4 5
5 6
3 4 5
4 5 6

3 4 5 6



[x]
i



$(i+1)(n-i)$