

Ques

X

10¹⁵

Y \rightarrow Only 2 bits are set

\rightarrow min possible value $|X - Y|$

①

0 0 0 \rightarrow 1 1
1 0 1
1 0 0 1
1 0 0 0 1

②

a \rightarrow

a << 4

0 - 63

7 6 5 4 3 2 1 0
0 0 0 0 0 0 0 1
0 0 0 0 0 0 1 0
0 0 0 0 0 0 1 1

for(int i = 0; i < 63; i++)

for(int j = i + 1; j < 63; j++)

long y = 1 << i | 1 << j

abs(x - y)

Ques

$$N = 5$$

$$M = 4$$

$$H = 3$$

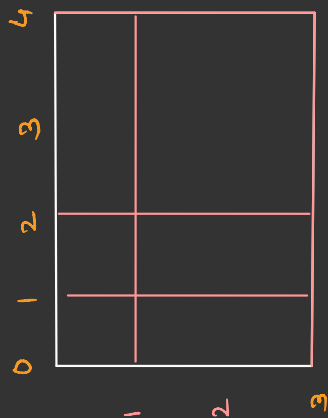
$$V = 2$$

$$H \quad \boxed{1 \mid 2 \mid 4}$$

$$V \quad \boxed{1 \mid 3}$$

$$\max h = \cancel{0}^1$$

$\left[\begin{array}{c} \\ \\ \\ \end{array} \right] h$



$\left[\begin{array}{c} \\ \\ \\ \end{array} \right] m$

Ques

k sum

$$k = 6$$

$$\boxed{2 \mid 3 \mid 4 \mid 9}$$

$$1 \quad 1 \quad 1 \quad 3$$

$$(18)$$

$$(10)$$

$$(7)$$

$$(6)$$

$$m = \cancel{8}^4$$

$$1 \leq k \leq 10^8$$

32 bit

$$2^{32}$$

$$\begin{array}{c} \text{31} \\ -2 \\ \hline \text{min} \end{array} \text{ to } \begin{array}{c} \text{31} \\ 2-1 \\ \hline \text{max} \end{array}$$

$$2^{31}$$

$$2^{10} \times 2^{10} \times 2^{10} \times 2$$

$$10^3 \times 10^3 \times 10^3 \times 2$$

$$\approx 10^9$$

$10^9 + 7$ \rightarrow max Prime number in range
of int

Ques Turn ith bit on

$$\begin{array}{r} 256 \\ 128 \end{array}$$

$$\begin{array}{r} 32 \\ 8 \\ 1 \end{array}$$

$$425$$

$$\begin{array}{cccccccc} & 7 & 6 & 5 & 4 & 3 & 2 & 1 & 0 \\ & 1 & 1 & 0 & 1 & 0 & 1 & 0 & 0 & 1 \\ \text{OR} & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ \hline & 1 & 1 & 0 & 1 & 1 & 1 & 0 & 0 & 1 \end{array} \quad \text{mask}$$

4th bit

$$x \mid 0 = x$$

$$x \mid 1 = 1$$

$$x \wedge 0 = x$$

$$x \wedge 1 = !x$$

$$x \& 0 = 0$$

$$x \& 1 \Rightarrow x$$

A	B	A ^ B
0	0	0
0	1	1
1	0	1
1	1	0

```
int mask = 1 << i;
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```
ans = input | mask;
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Turn off ith bit

i = 5

0 7 6 5 4 3 2 1 0
1 1 0 1 0 1 0 0 1

& 1 1 1 0 1 1 1 1 1] mask

1 1 0 0 0 1 0 0 1

0 0 0 1 0 0 0 0 0

1 1 1 0 1 1 1 1 1

mask = ~(1 << i);

ans = input & mask;

Ques toggle ith bit

$i = 3$

4 3 2 1 0
1 0 1 1 0 1

N 0 0 1 0 0 0

3 2 1 0
1 0 1 0 \Rightarrow 10

ON $i = 2 \Rightarrow 14$

OFF $i = 1 \Rightarrow 8$

toggle