

24

1 (2 ~ 23) 24

$O(n)$

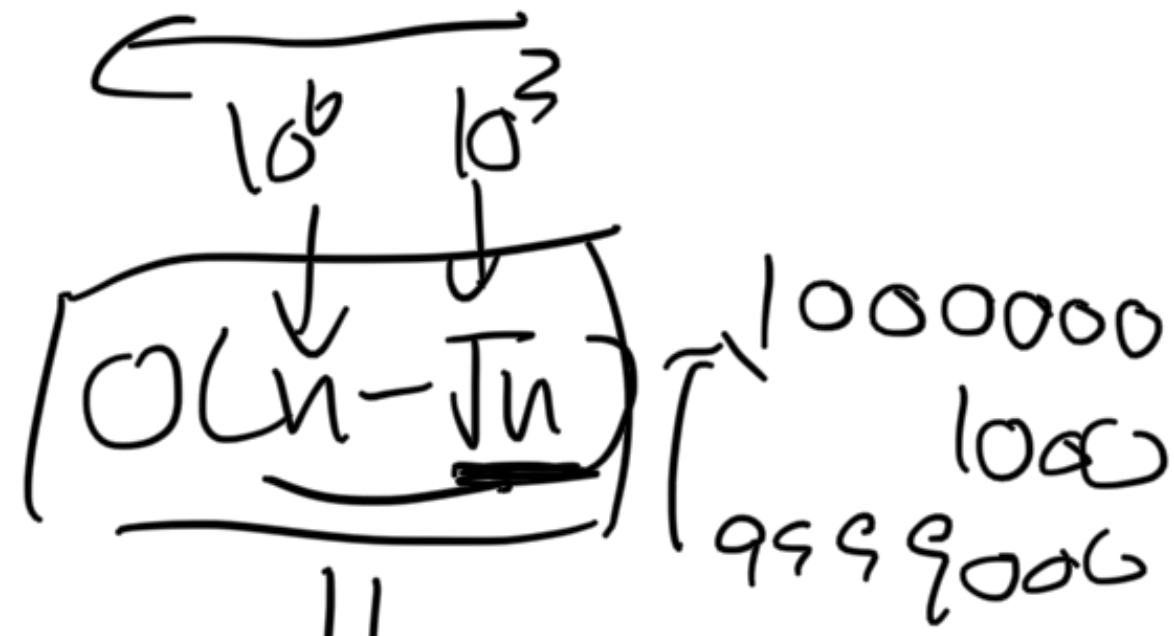
→ (2 ~ $\sqrt{24}$)

$O(\sqrt{n})$



$$a \times b \neq n$$

$$n-1$$



$$10^7 \sim 10^8$$

$$2 \times 10^9$$

$$O(n)$$

$$O(\sqrt{n})$$

$$n = 2 \times 10^9$$

$$\sqrt{n} \approx 4 \times 10^4$$

$$a \rightarrow \frac{n}{a}$$

<cmath>

<cmath>

sqrt

for (int i = sqrt(n); i >= 2; i--)

int a = 2.6;

cout << a;

$i \leq \sqrt{n}$
 $i * i \leq n$

for (int i = 2; $i * i \leq n$; i++)

$2 - \sqrt{n}$

%

$$10 = 3 + 7 \\ = 5 + 5$$

$$2 \sim 10$$



$$i \rightarrow [2, 3, 4, \dots, \frac{k}{2}]$$

$$(i) \quad (\frac{k-i}{2})$$

$$2 \quad k-2 \\ 3 \quad k-3$$

$$\vdots$$

$$\frac{k}{2}$$

$$2 \quad 3 \quad 4 \quad \dots \quad \sqrt{n}$$

$$n \% 2 \quad n \% 3 \quad n \% 4 \quad \dots$$

$$1 \dots k \text{ prime } (int \ k)$$

bool

1 - 1

11 2 - 3 - ... 是不是K的因数

for (int i = 2; i * i <= k; i++)

if (k % i == 0)

return false;

return true;

}

2 ~ N

$\boxed{\%}$

(10)

=

+

1

→

2

+

8

X

→

3

+

7

✓

10

1

6

$$4 - 1 = 3$$

$$5 + 5 = 10$$

最大公約數

gcd

$$3 \rightarrow 6$$

\geq 是 6 和 9 的公約數

$$3 \rightarrow 9$$

$$6: \quad 1, 2, 3, 6$$

$$9: \quad 1, 3, 9$$



3和4的最小公倍数 lcm

3: 3 6 9 (12) 15

4: 4 8 (12) 16

(12)

12 ~~4~~ 6 12 12 ~~4~~ 8 16

$$192 = \underline{12} \times \underline{16} = (4) \times (48)$$

12
24
36
(48)
60

16
32
(48)
64



$$12 = \cancel{3} \times \cancel{4}$$

$$16 = \cancel{4} \times \cancel{4}$$

$$48 = \cancel{3} \times \cancel{4} \times \cancel{4}$$

$$18 = \cancel{3} \times \cancel{6}$$

$$24 = \cancel{4} \times \cancel{6}$$

$$72 = \cancel{3} \times \cancel{4} \times \cancel{6} \times \cancel{6}$$

$$a \times b = \text{lcm}(a, b) \times \text{gcd}(a, b)$$

$$\Rightarrow 60$$

P Q

P和Q最大公约数是3
最小公倍数是60

$$P \times Q = 3 \times 60 = 180$$

$x_0 \times y_0$

n

$\sqrt{180}$

$\sqrt{n} \times \sqrt{n}$

$\sqrt{180} \times \sqrt{180}$

$O(\sqrt{n})$

$P \geq Q \geq 10$

10^{10}

$O(\sqrt{n})$

$\gcd(a, b)$

$1 \sim a \rightarrow$ 因数: $1 \sim \sim$

$1 \sim b \rightarrow$ $1 \sim \sim$

18 24

1-18 →

1 2 3

6 9 18

1-24 →

X

int gcd (int a, int b)

for (int i=a; i>=1; i--)

if (a%i==0 && b%i==0)

return i;

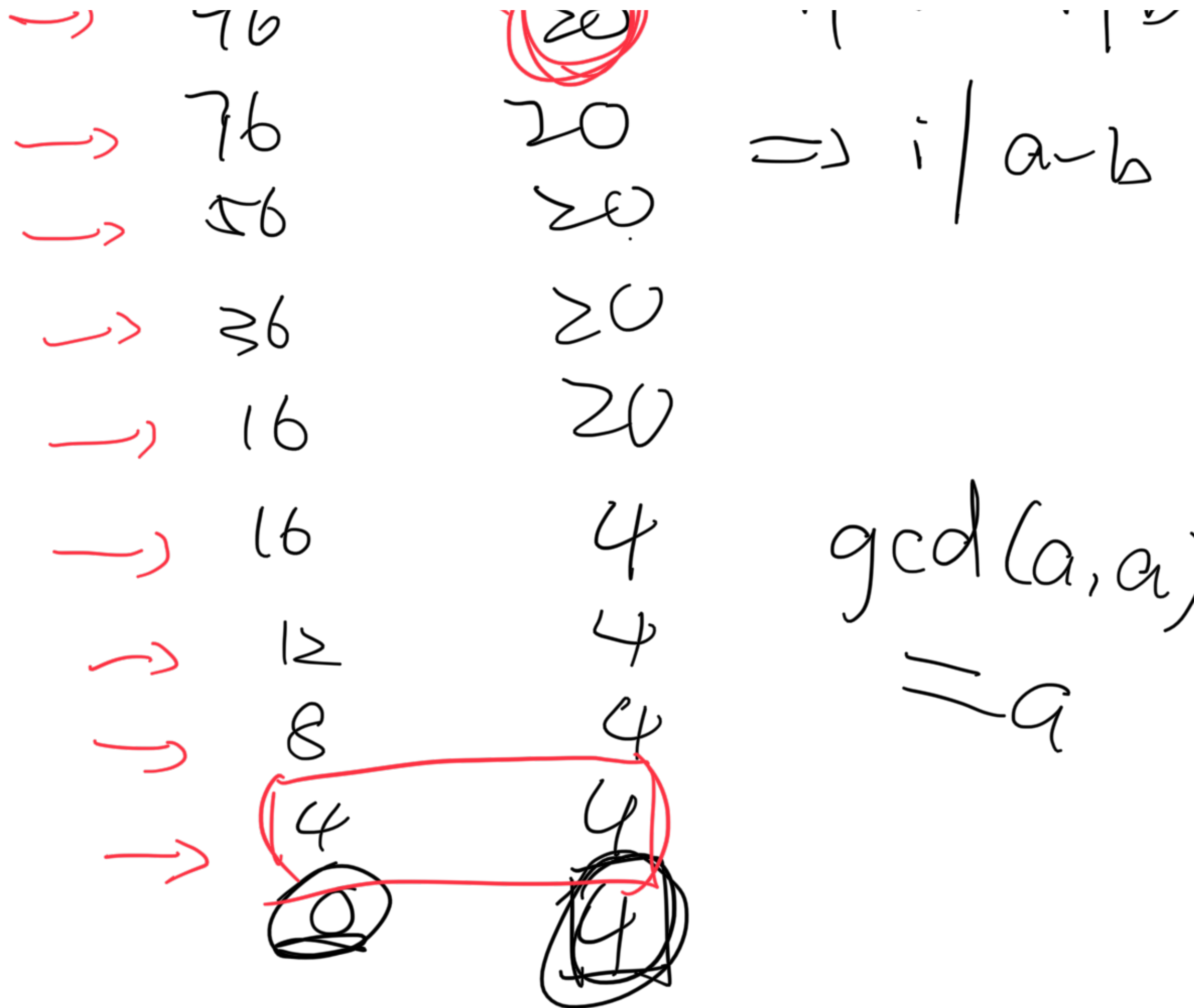
06m3

96

116

i/a

i/b

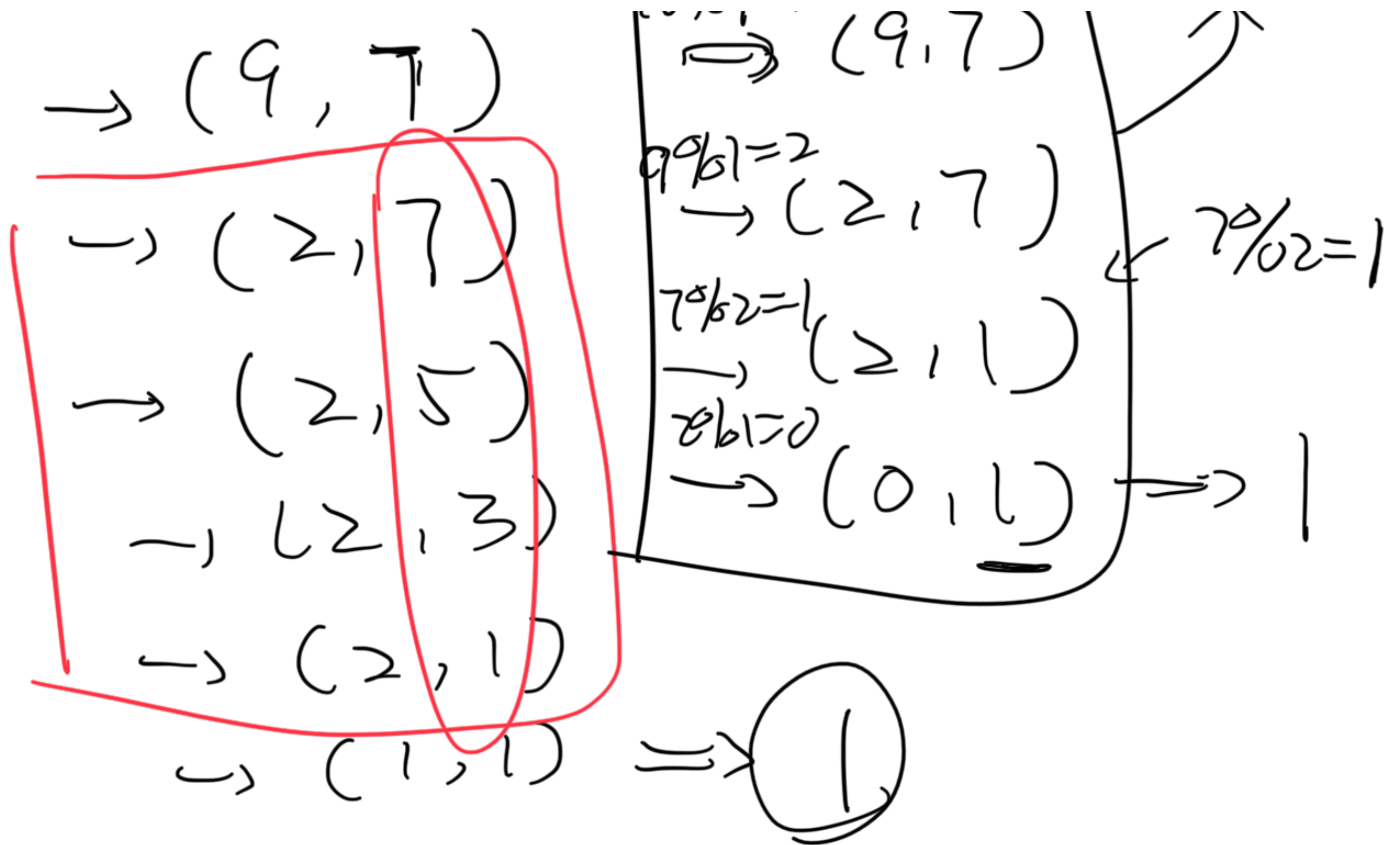


$$\gcd(a, a) = a$$

(9, 16)

$16 \% 9 = 7$
 (9, 7)

5 8 7 6 5 4 3 2 1



$$O(\log_2 n)$$

$$O(n)$$

20

11

1000000

~

