$GCD(a,b):$

$(3,6) = 3$

$(1,5) = 1$

$(4,4) = 4$

$(4,6) = 2$

$(5,0) = undefined$

$$1 \le GCD(a,b) \le min(a,b)$$

(a,b)

$x = max(a,b)$ $func(a,b)$

$y = min(a,b)$

$gcd = func(y, x \% y)$

$\downarrow$

return

$GCD(6,4) \rightarrow (GCD(4,2))$

x = 6
x = 4

GCD(4, 2)

2

2

x = 4
y = 2

GCD(2, 0) → 2

GCD(2, 0)
(a, b)

return 2
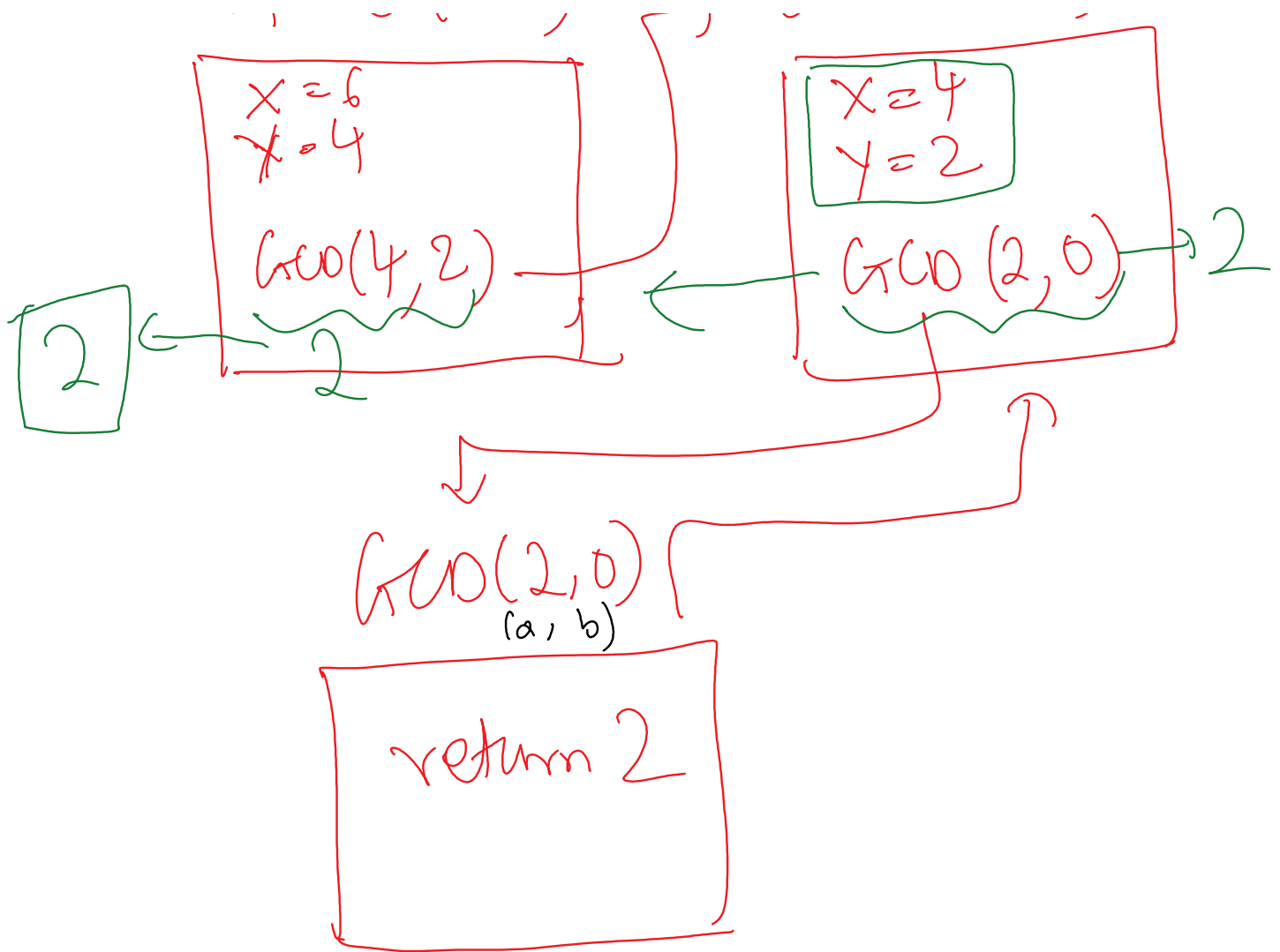
(X, 2, 3, X, 5, 4, 5, 2)

1. Remove Duplicates

2. Check how many unique values

   ↳ min(unique_values)

3. Sort values
   $\hookrightarrow$ 2nd last no.

(1, 2, 3, (4), 5)

(5, 5, 5, 5)

$\hookrightarrow$ (5)

$\hookrightarrow$ min(5) = 5

(3, 4, 4, [3], 4)

$\hookrightarrow$ (3, 4)

$\hookrightarrow$ min(3, 4) = 3

(1, 2, 3, 1, 5, 4, 5, 2)

$\hookrightarrow$ ((1), (2), (5), (3), (4))

longest = ~~0~~ ~~1~~ ~~2~~ 5

second = ~~0~~ ~~1~~ ~~2~~ ~~3~~ 4

2 > longest

3 > longest

$$(1000) \rightarrow n \cdot \log(n)$$

$$\rightarrow 1000 \cdot \log(1000)$$

$$\rightarrow 3000$$

$$(1000) \rightarrow \boxed{O(n)}$$

$$\searrow 1000$$

Fibonacci : 0 1 1 2 3 5

```
a = 0
b = 1
c = 2
```

temp = a → 1

a → b → (a = 1)

$L c = 2 \int$

$a'' = b \rightarrow (a=1)$

$a = 1$
$b = 2$

$\boxed{b = temp + b}$

$\hookrightarrow (1+2) = 2$

$temp = a = 1$

$a = b \Rightarrow a = 2$

$b = 1 + 2 = 3$

Q5. $dict(ch : \#count)$

Q6. $num = 1$

$num = 1$

$digits = (1)$

$1^3 = 1$ } Armstrong

$num = \boxed{1\,5\,3}$

$digits = (1, 5, 3)$

$\downarrow \ \downarrow \ \downarrow$

$1 \ 125 \ 27$

$\underbrace{\qquad}$

125
27
1

$\boxed{1 5 3}$

1. Iterate over range

2. For each num

  ↳ Identify digits

  ↳ Add cubes of digits

  ↳ Check

$$10\overline{)153}\quad\begin{array}{r}15\\\end{array}$$

```
      15
10 | 153
     10
     ---
      53
      50
      ---
       3
```

```
     1
10 | 15
    10
    ---
     5
```

```
     0
10 | 1
    0
    ---
    1
```

Q7. aababcccc ~ a3b2c3

count = 9

res = " "

1. Iterate over string

2. Check prev. character

res =
↓
"a3b2"

⤷ If same, inc. counter
⤷ If not same, print ch. & counts
& reset the counts

Qf.

0̶ 1̶ 2 3̶ 4 5 6 7
a b c a b c b b
                abc
[3]

3 bca

3 cab

3 abc

2 bc

last seen idx → ch

start idx → num

end idx → num