

Code your logic \rightarrow length

[1, 2, 3] \rightarrow 3

len(list)

Python

human readable format

code

machine compiler

1010101

len(list) = 3

1

2

list.count() = 3 + 0 = 3

1: 1, 2: 1, 3: 1

① $\text{len}(\text{list}) = \underline{3}$ $\text{list} = [1, 2, 3]$

② $\text{dict} = \{x: \text{list.count}(x) \text{ for } x \text{ in list}\}$

$\text{dict} = \{1: 1, 2: 1, 3: 1\}$

$\text{sum}(\text{dict.values}) = \underline{\underline{3}}$

Diagram annotations: Arrows point from the word "values" to the values 1, 1, and 1 in the dictionary representation.

③ own approach.

(Simple)

① lines of code

D₁ code

100 lines

D₂
80 lines

② Performance ↑
(less time taking)
(time complexity)

3 sec

~~6~~ 3 sec

1st list = [1, 2, 3]

1 start = time()

len(list)

end = time()

diff = end - start

print(diff) = 0.03 sec

2nd ~~list~~ logic

start = time()

count

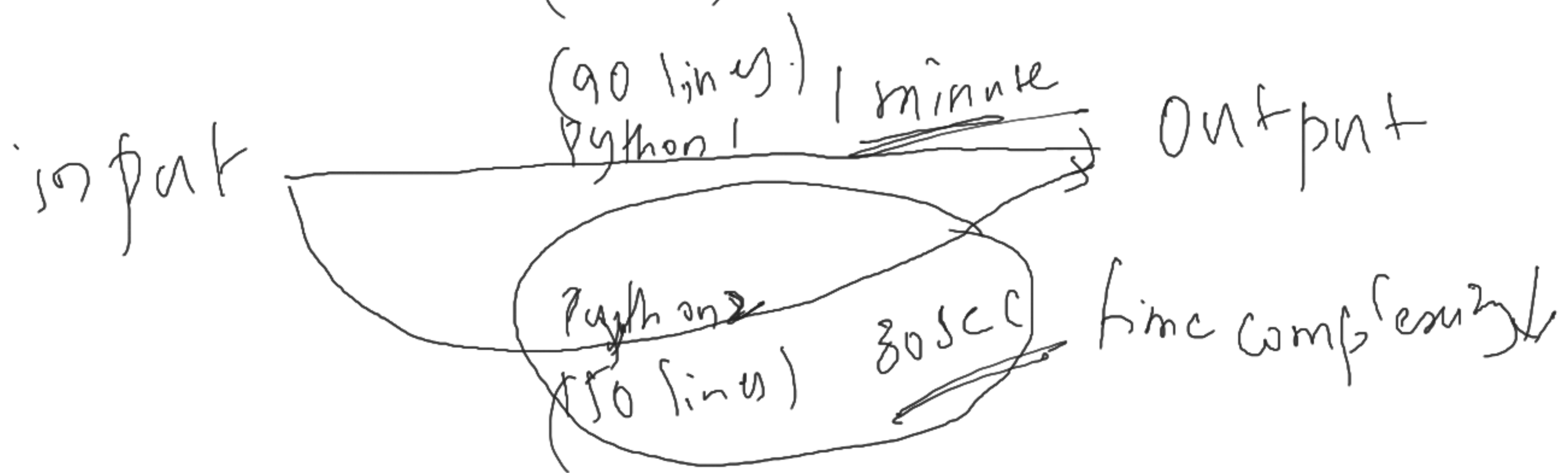
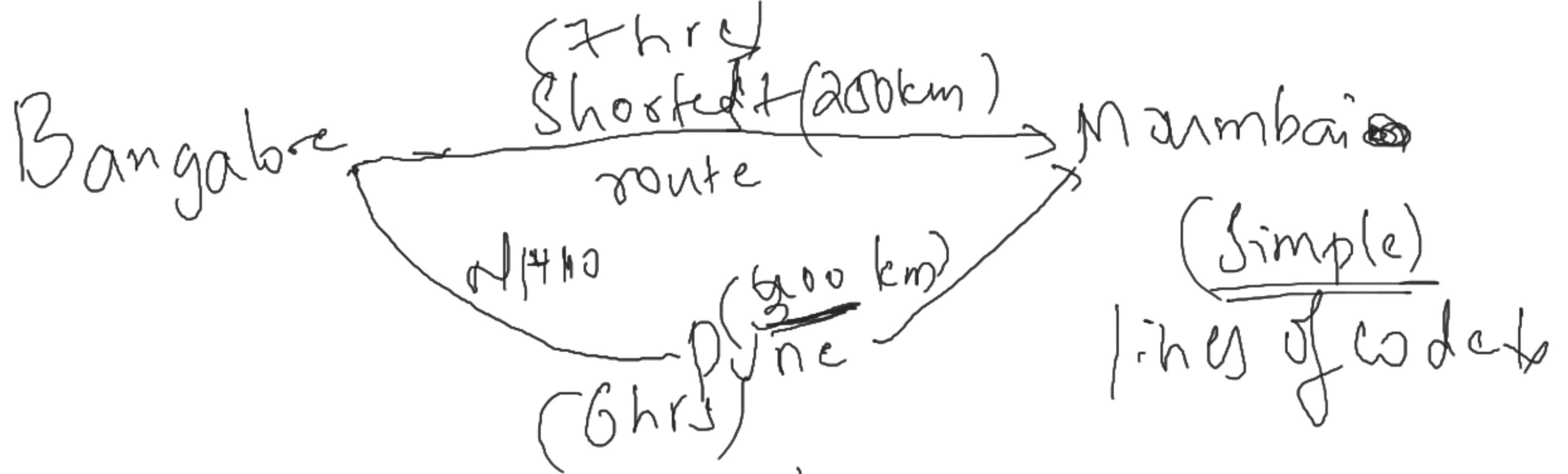
(dict sum)

end = time()

diff = end - start

diff = 1 sec

sum



① time \propto

② Simple (less lines of code)



$[[], [], []] \rightarrow$ list of lists \rightarrow nested list

[lists]
input = $[5, 5, 10]$, $[5, 5, 7, 8]$, $[5, 5, 8, 9]$

Python
function

$[5, 5]$

list

input = $[[1, 2], [1, 4, 3], [1, 5, 6]]$

Python

output = $[1]$

input = $[[5, 6, 8], [1, 5, 8, 6, 2], [5, 2, 6, 8]]$

output = $[5, 6, 8] = [8, 6, 5]; [6, 8, 5]$

input = $\left[[1, 2], [1, 2, 3], [\text{del} 4, 5] \right]$

Output = $\left[\right] = \left[\right]$

input = $\left[[5, 5, 10, 9, 8], [5, 5, 8], (5, 5) \right]$
= $[5, 5]$

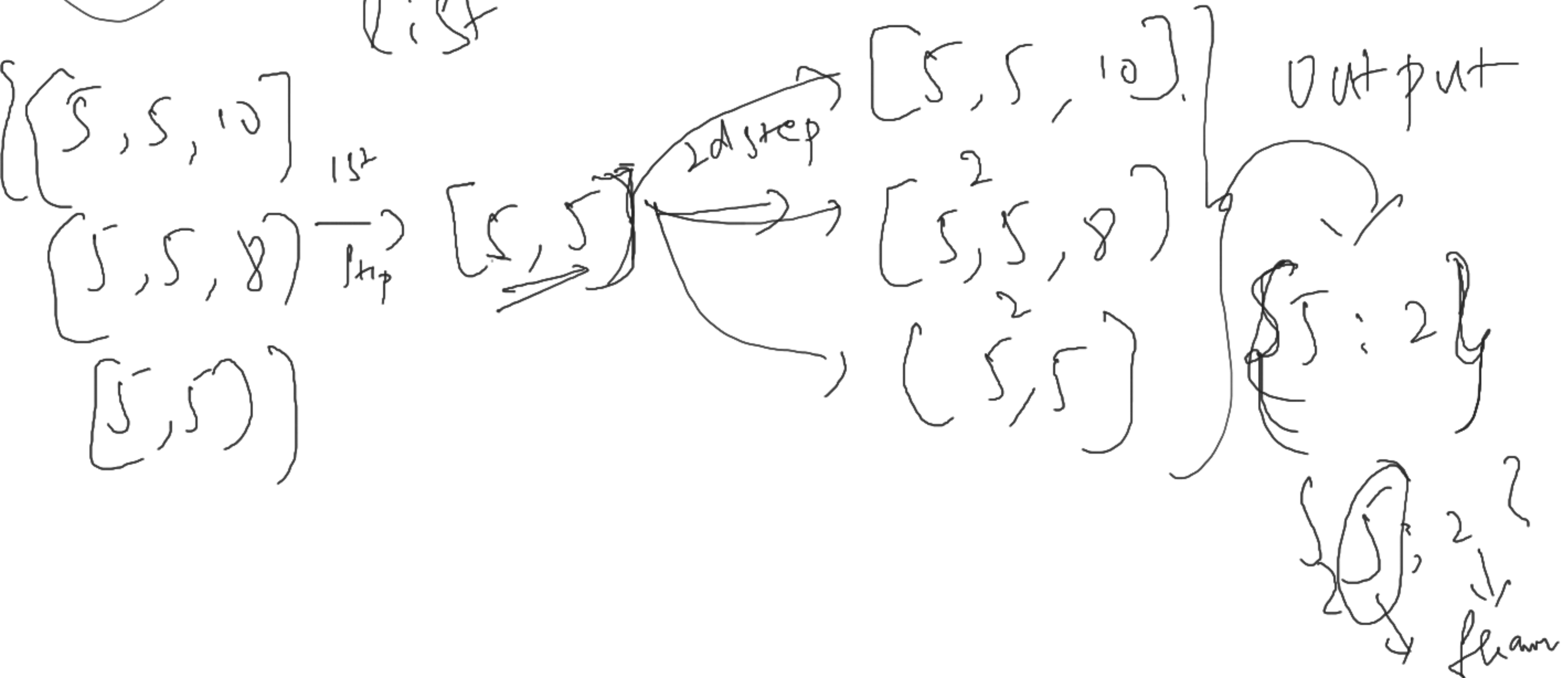
① find the Smallest list.

input = $[[5, 5, 10], [5, 5, 8], [5, 5]]$

function (logic) → output

$[5, 5]$

2 compare smallest list with every other list



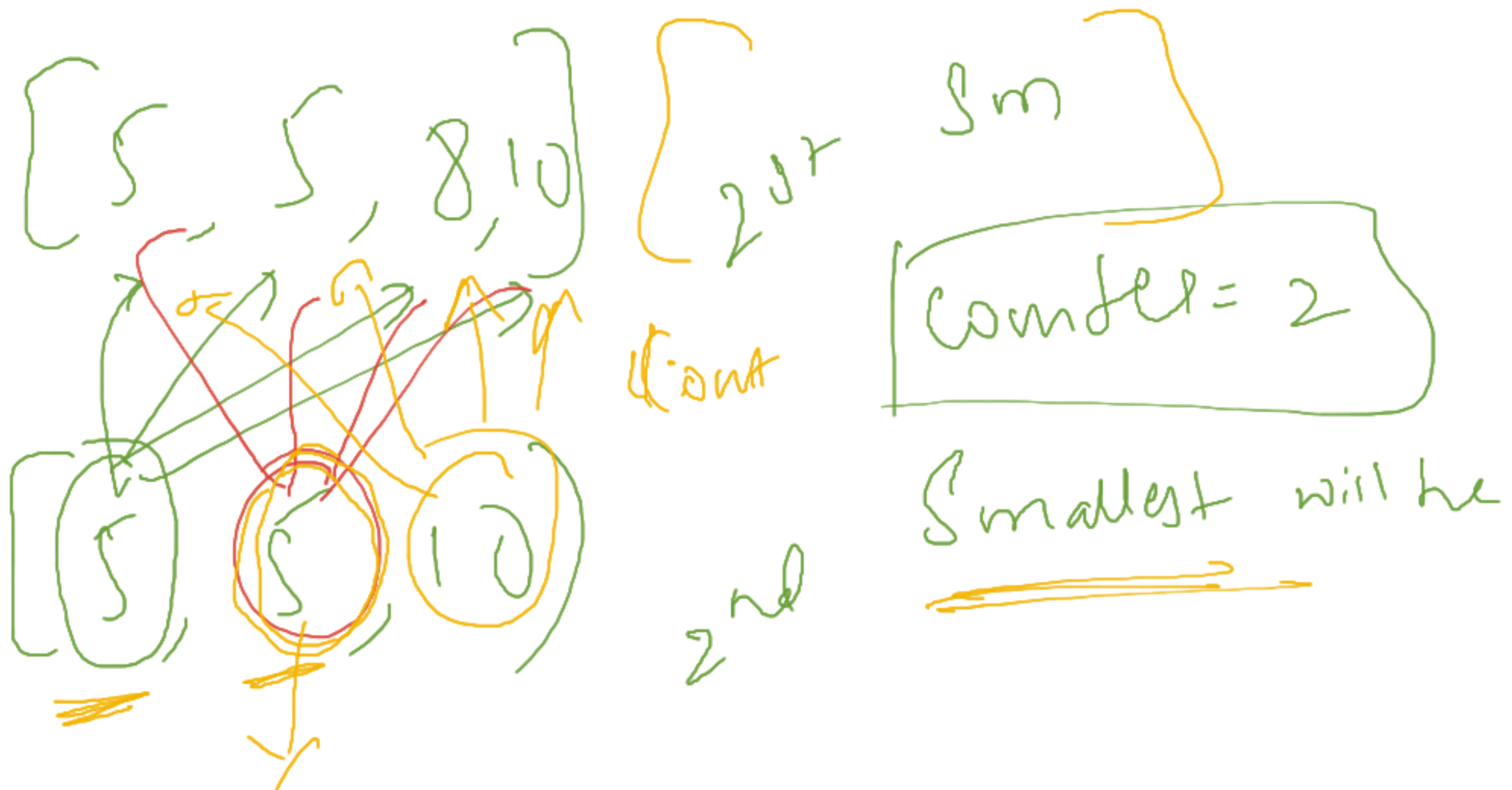
$[5, 5, 10]$, $[5, 8, 10]$, $[5, 5, 10, 2]$
 $[5, 5, 5, 10]$



Counter = 0
 $5:2$

Counter = ~~1~~
 If Counter = 2

key will be common elements
 in the list
 value will be frequency of the
 common element



~~[5, 5] [5, 5, 5] [5, 5, 5]~~

count = 0

for 5 (5)

count = 1

[5]

[5, 5]

5 : 2

[5, 5]

[5, 5]

5 2

element frequency > count
5 : 12

[5]

[5, 5] [3, 5, 6]

Smallest element = 5
list = [3, 5, 6]

Smallest = list
min-length dict

[5, 5]

{5: 2}

Counter = ?
Counter = 1

dict
{k: v} value
dict[k] = 2

modified

dict[Smallest element] > Counter
2 > Counter
dict[Smallest element] = Counter

{5: 1}



- 1 minimum length list $\{5, 5\}$
- 2 get out frequency dictionary $\{5: 2\}$
- 3 final output $[5, 5]$

$[[5, 5, 10], [5, 5, 7, 8], [5, 8, 9, 10]]$

① Smallest list = $[5, 5, 10]$

② final_out_dictionary = $\{5: 1, 10: 0\}$

③ final Output = $[5]$