

CS50 for MBAs

Data Structures



<code>bool</code>	Boolean value
<code>float</code>	floating-point value
<code>int</code>	integer
<code>str</code>	string
<code>...</code>	

dict

list

range

set

tuple

...

ICK ME UP



B C D E F G H I

K L M N O P Q R

T U- V W X Y Z



CHOKIN
FROM IS AHEAD
VISION STOPS RESPIRATOR

5 5 5





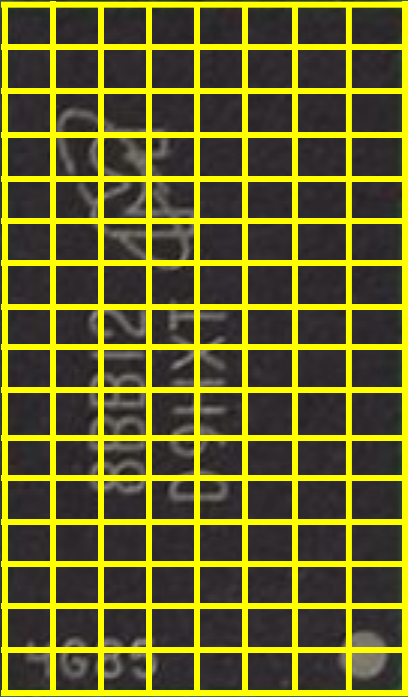
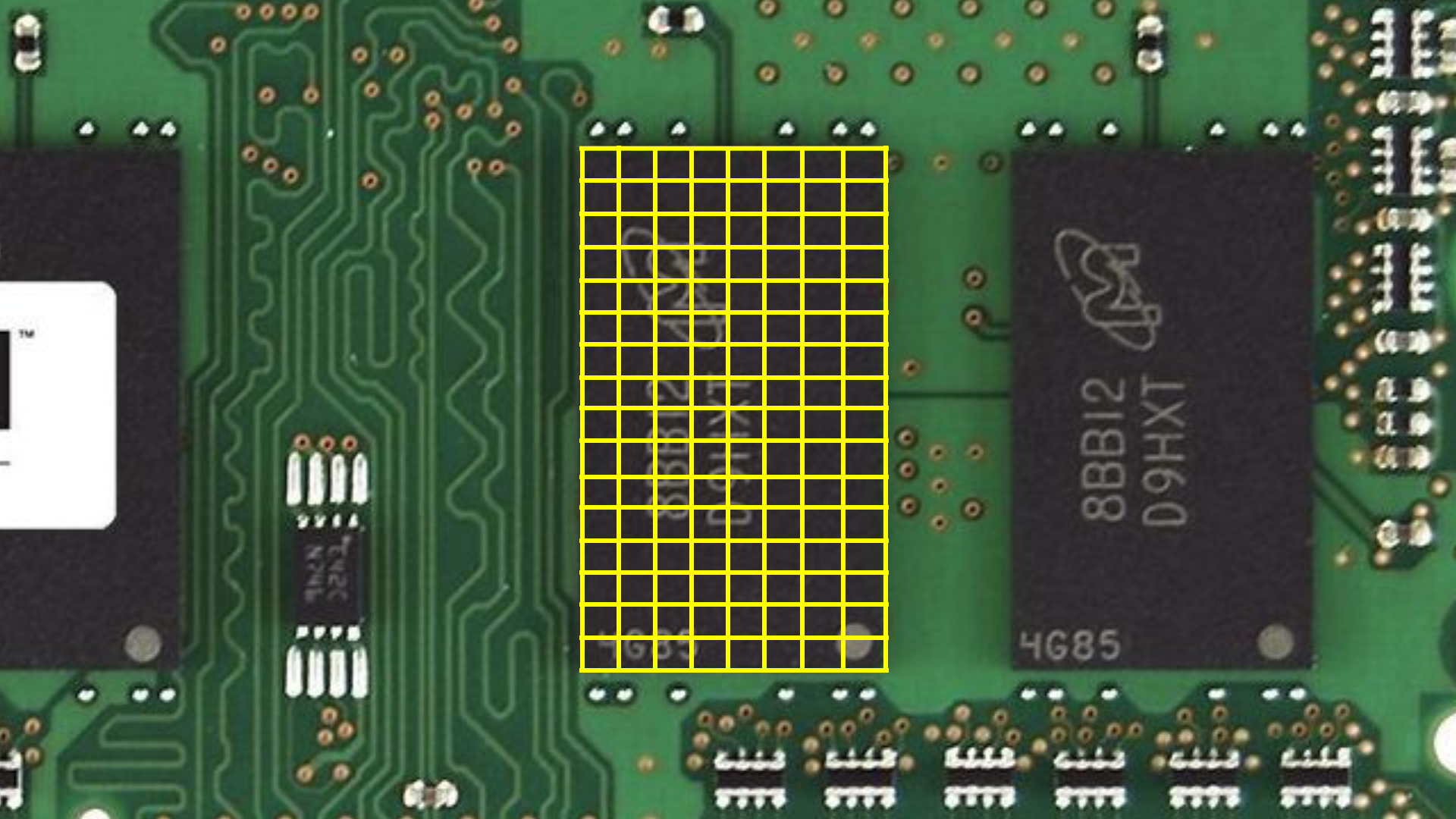
8BB12
D9HXT

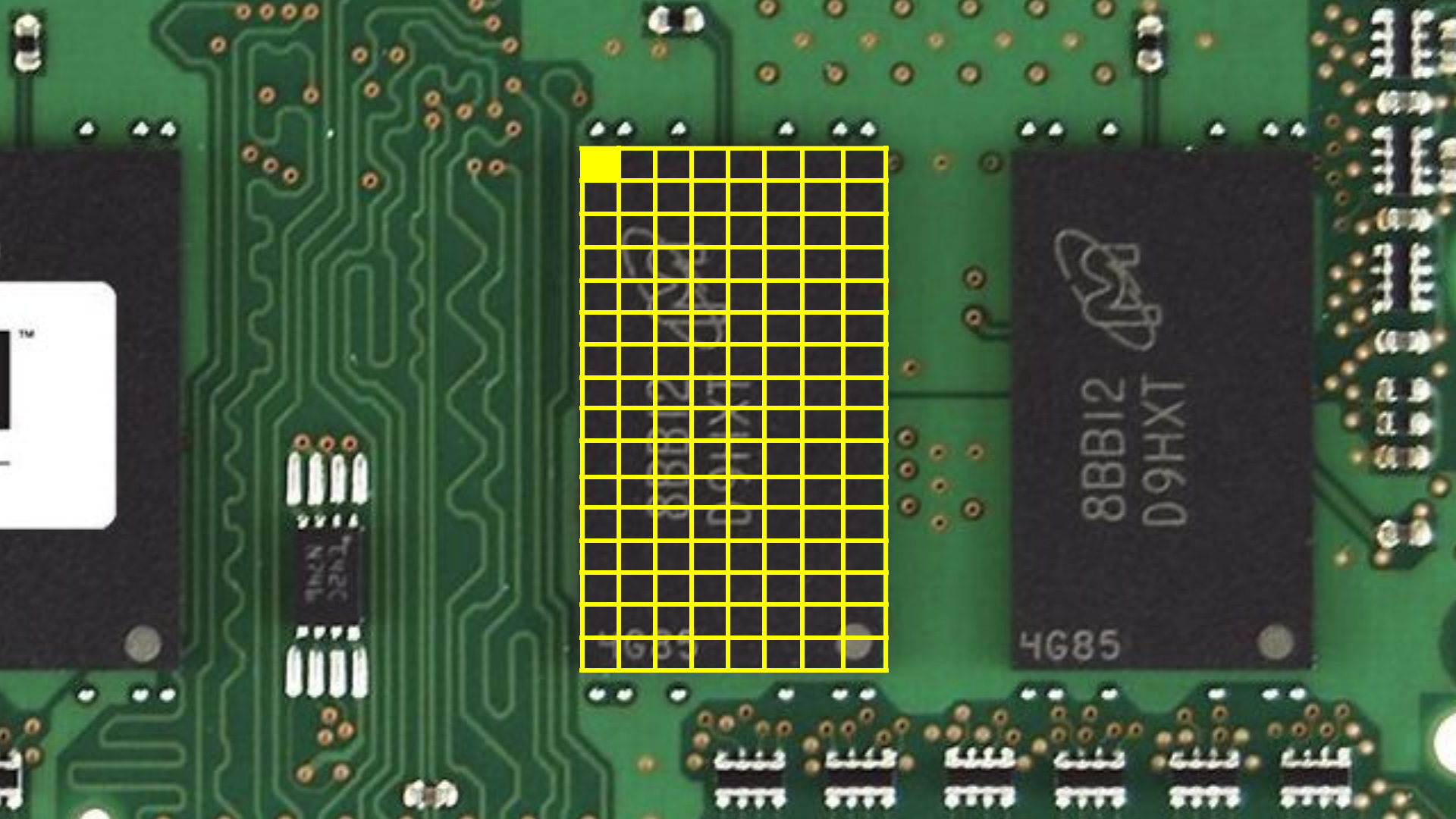
4G85



8BB12
D9HXT

4G85



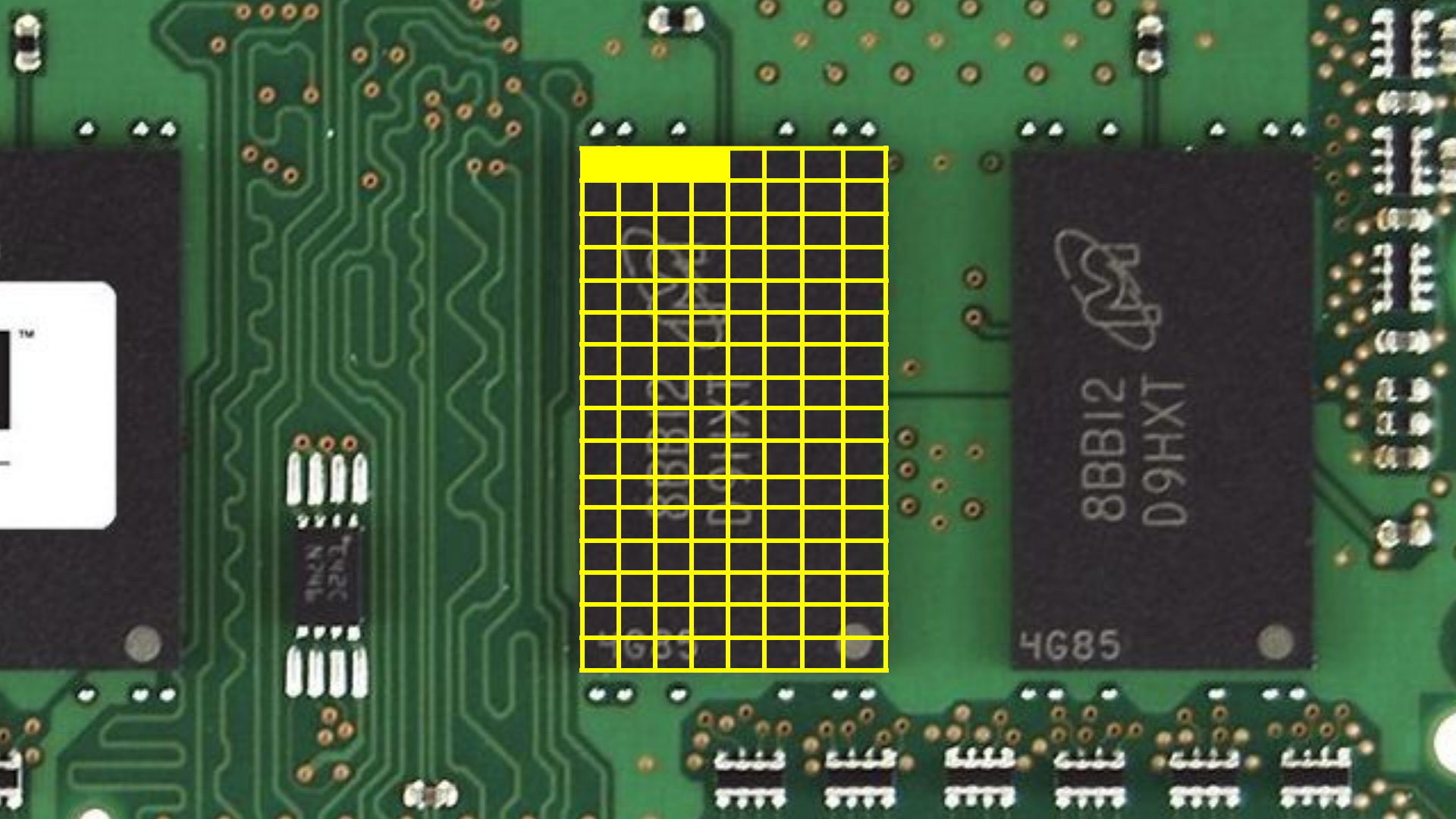




8BB12
D9HXT

4G85







8BB12
D9HXT

4G85

8BB12
D9HXT

3442
2502

arrays





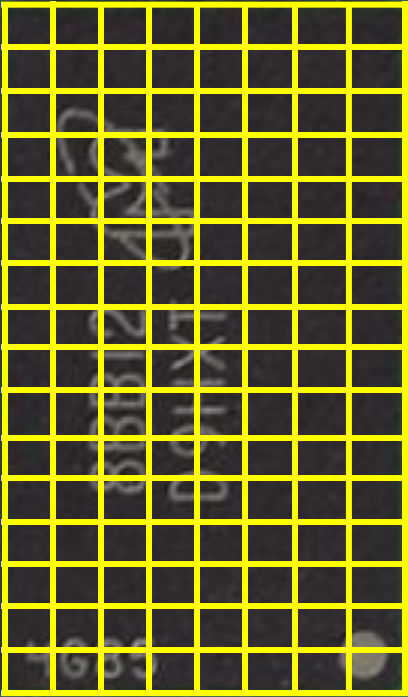
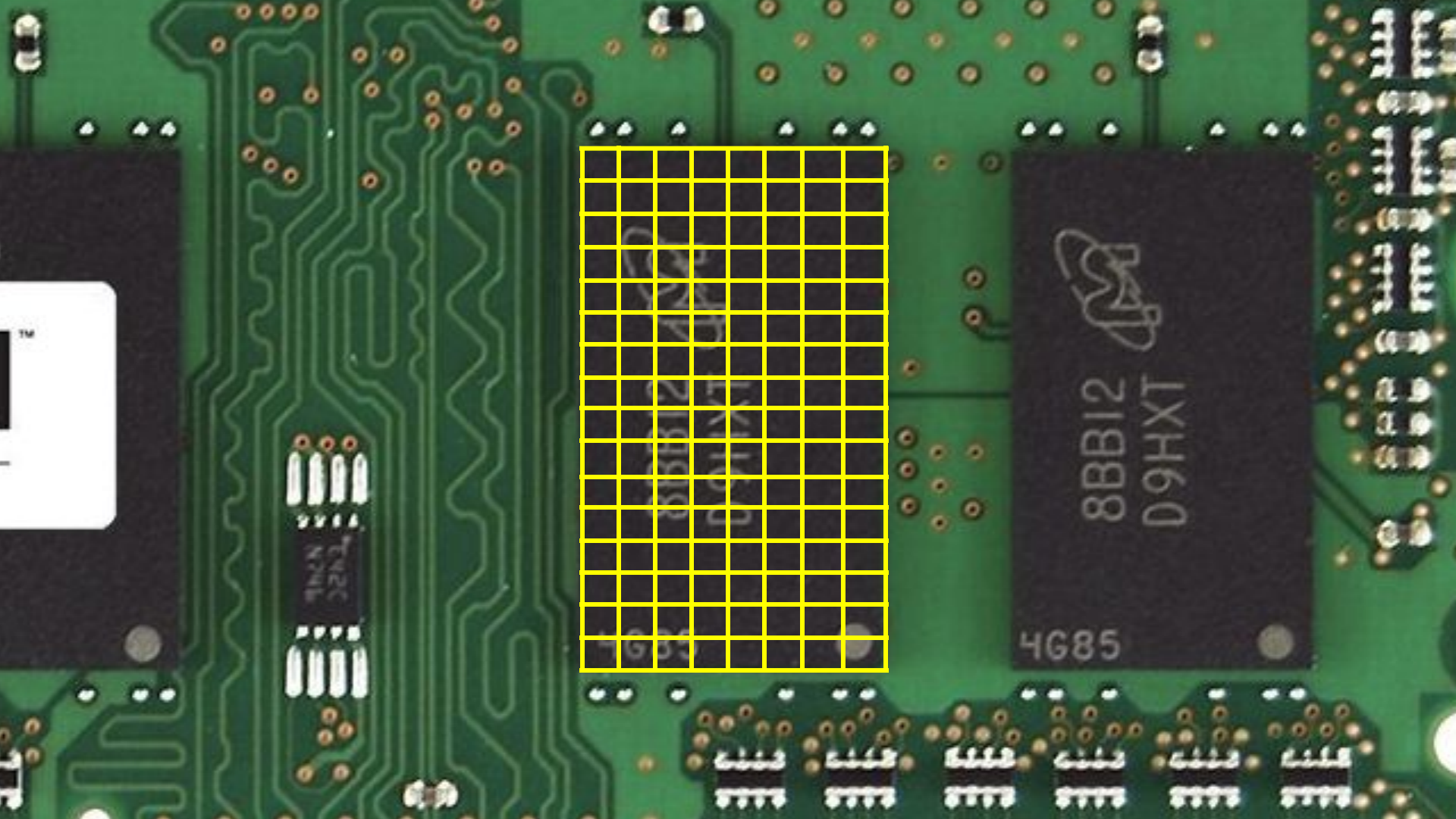
8BB12
D9HXT

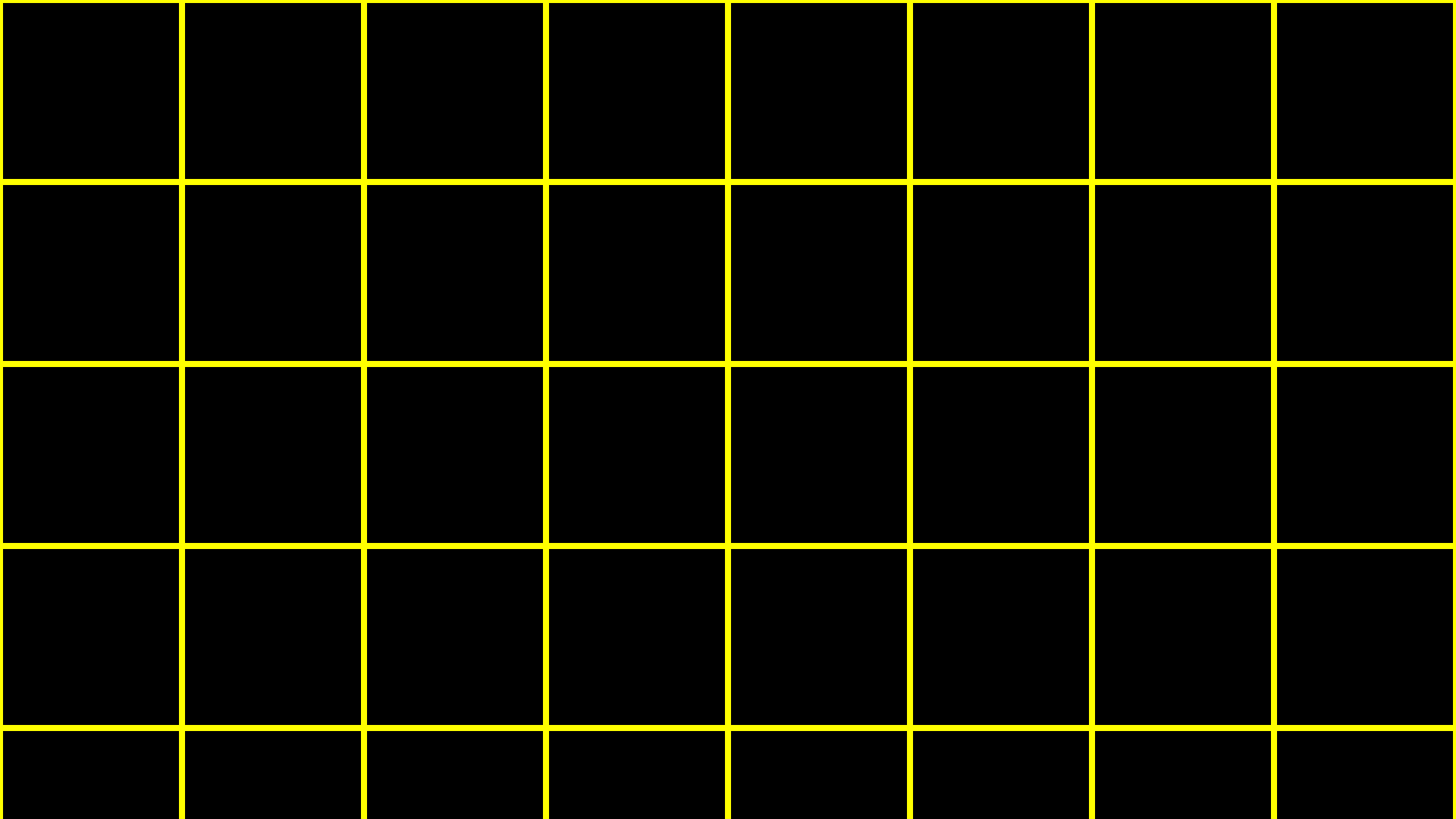
4G85

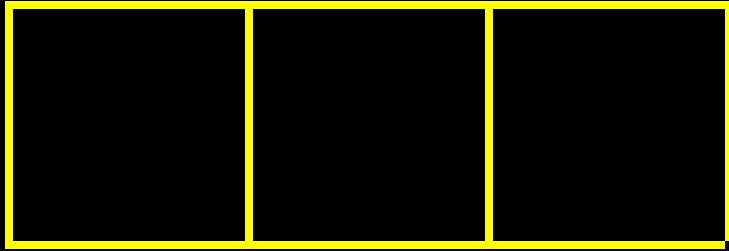


8BB12
D9HXT

4G85





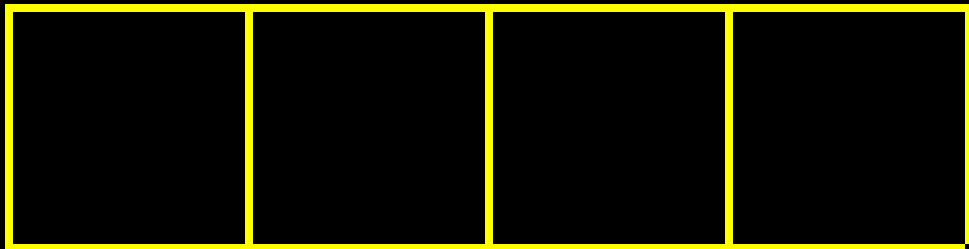
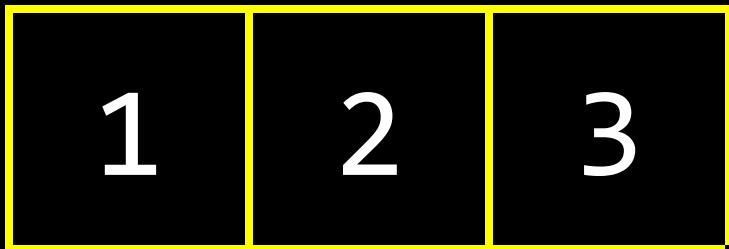


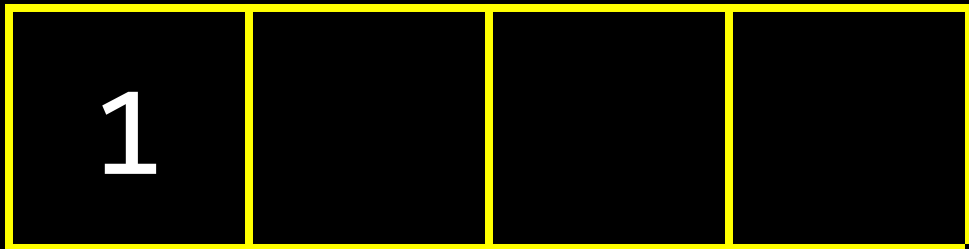
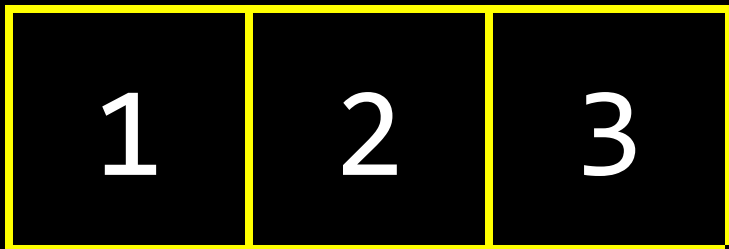
1	2	3
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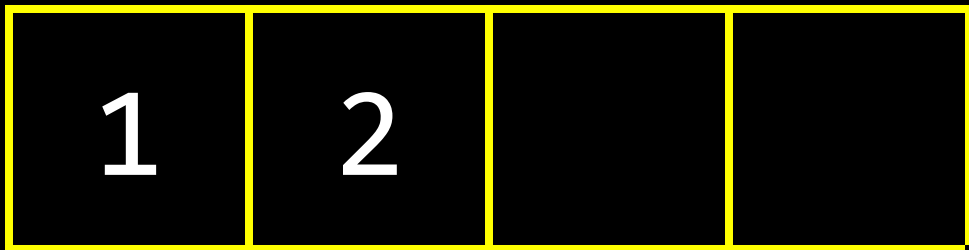
1	2	3	
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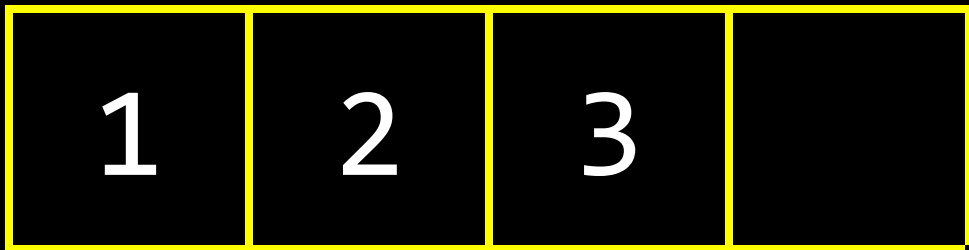
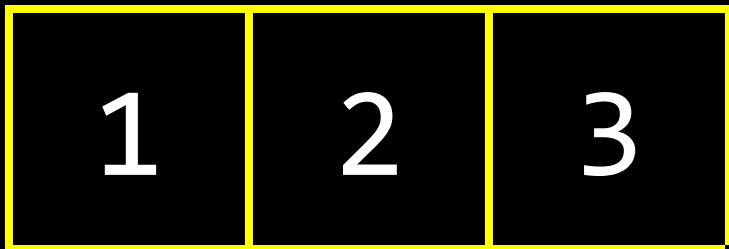
	1	2	3				

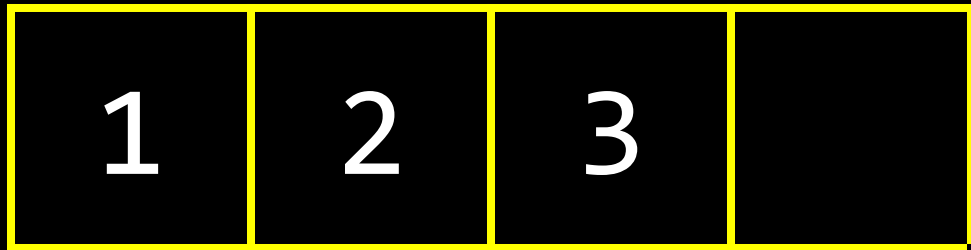
?	?	?	?	?	?	?	?
?	1	2	3	?	?	?	?
?	?	?	?	?	?	?	?
?	?	?					

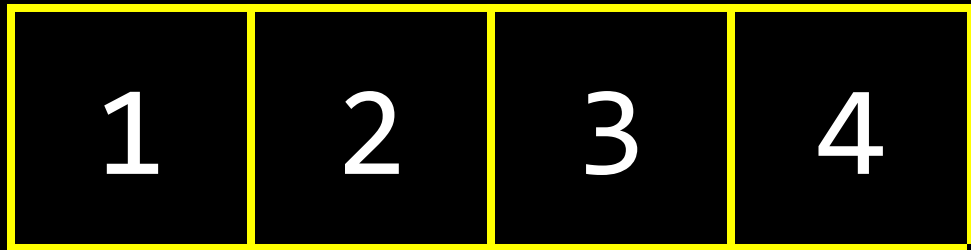












$O(n^2)$

$O(n \log n)$

$O(n)$

$O(\log n)$

$O(1)$

$O(n^2)$

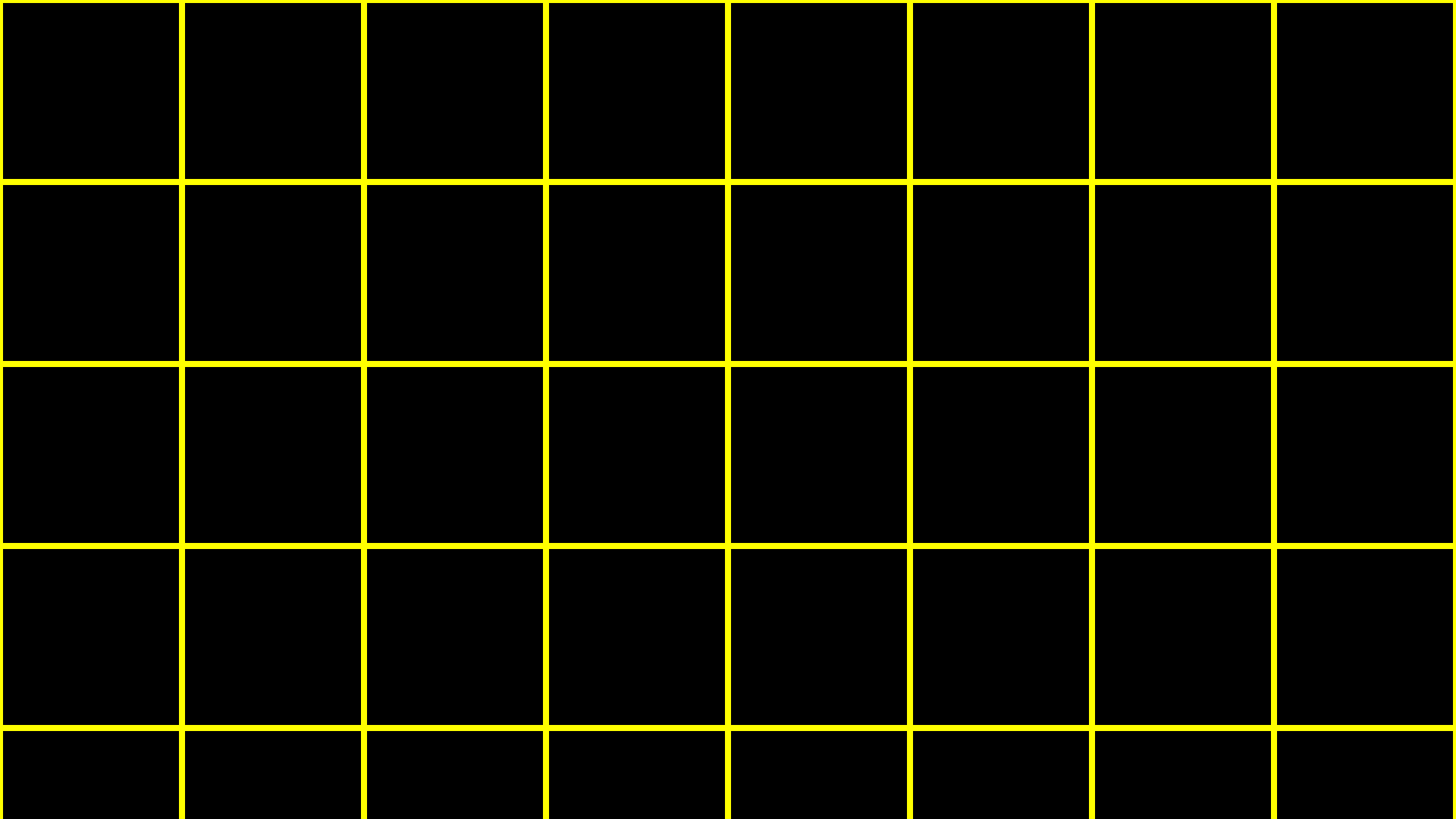
$O(n \log n)$

$O(n)$ insert

$O(\log n)$ search

$O(1)$

linked lists



1

0x123

1

0x123

2

0x456

1

0x123

2

0x456

3

0x789

1

0x123

2

0x456

3

0x789

1

0x123

0x456

2

0x456

3

0x789

1

0x123

0x456

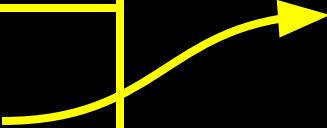
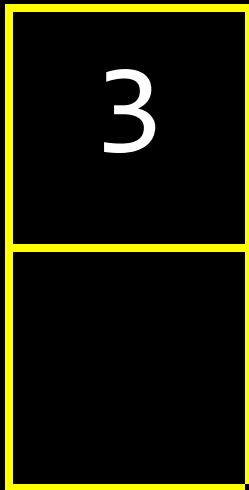
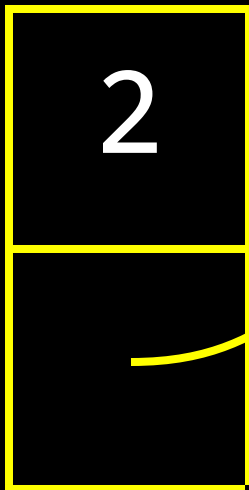
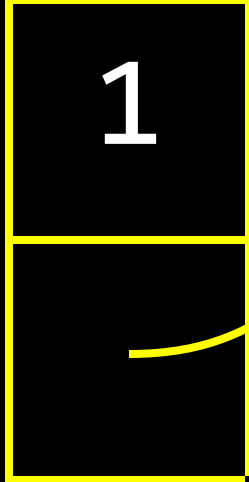
2

0x456

0x789

3

0x789



dict

list

range

set

tuple

...

trees

binary search trees

1

2

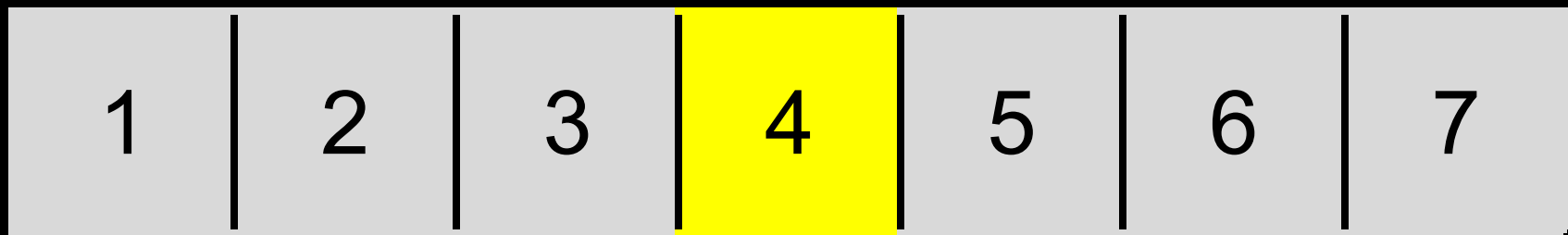
3

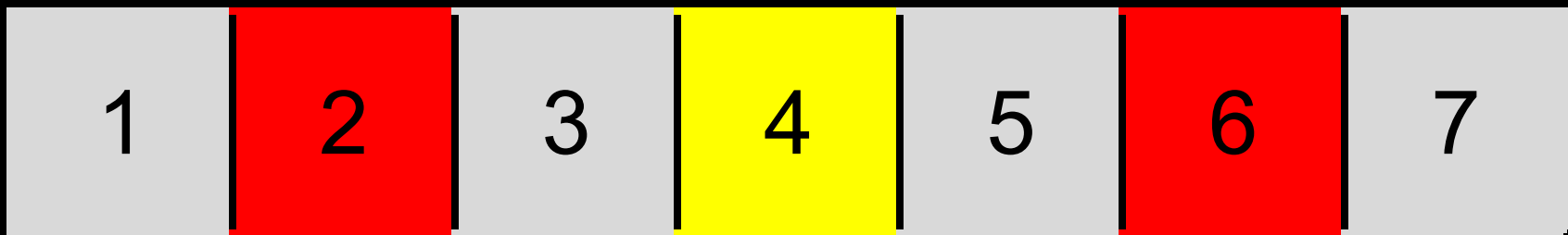
4

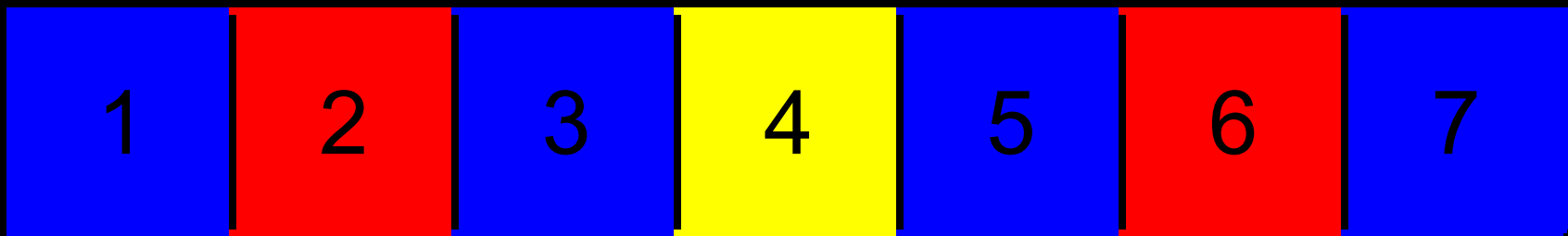
5

6

7







4

2

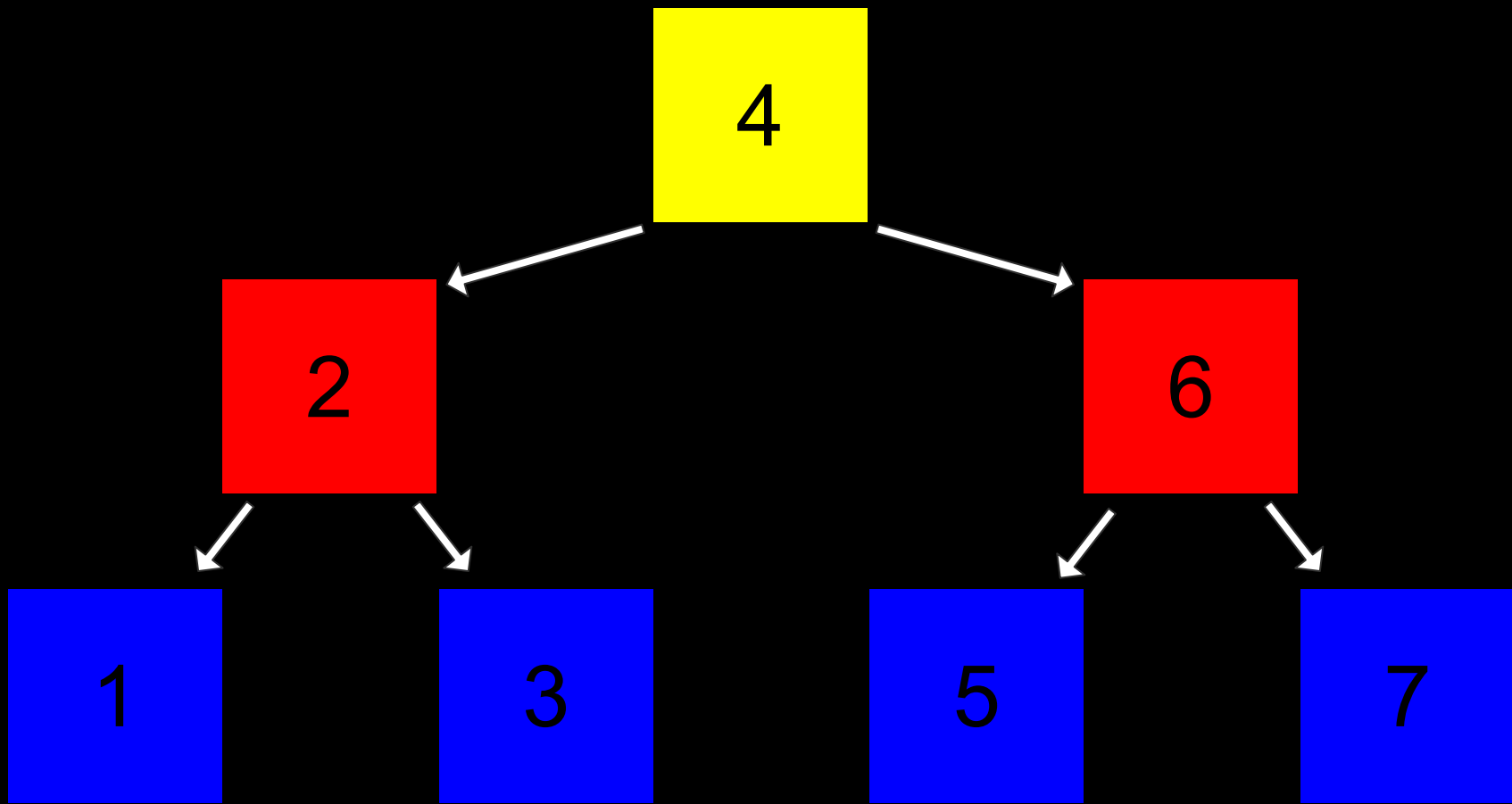
6

1

3

5

7



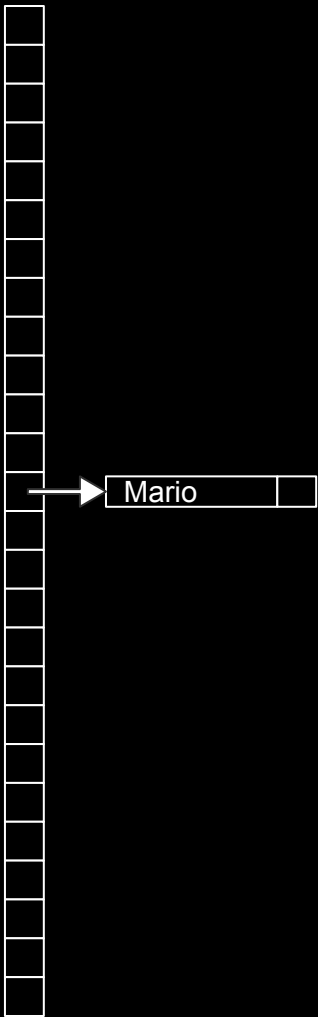
hash tables

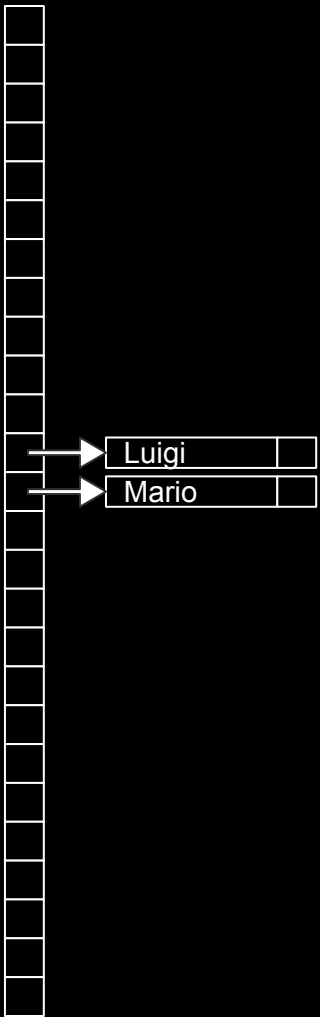


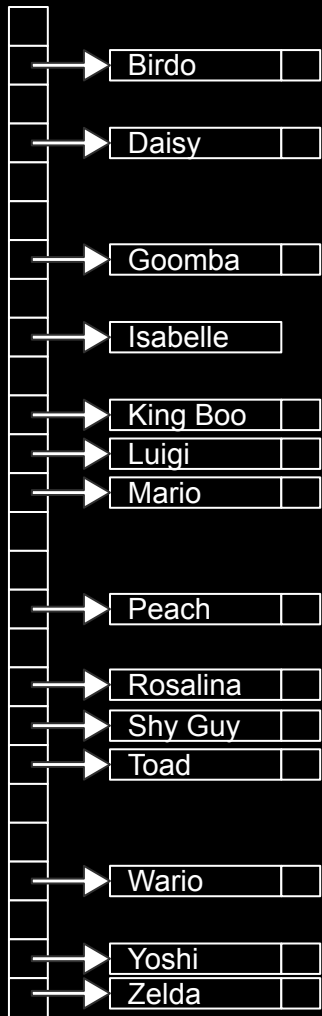
0	
1	
2	
3	
4	
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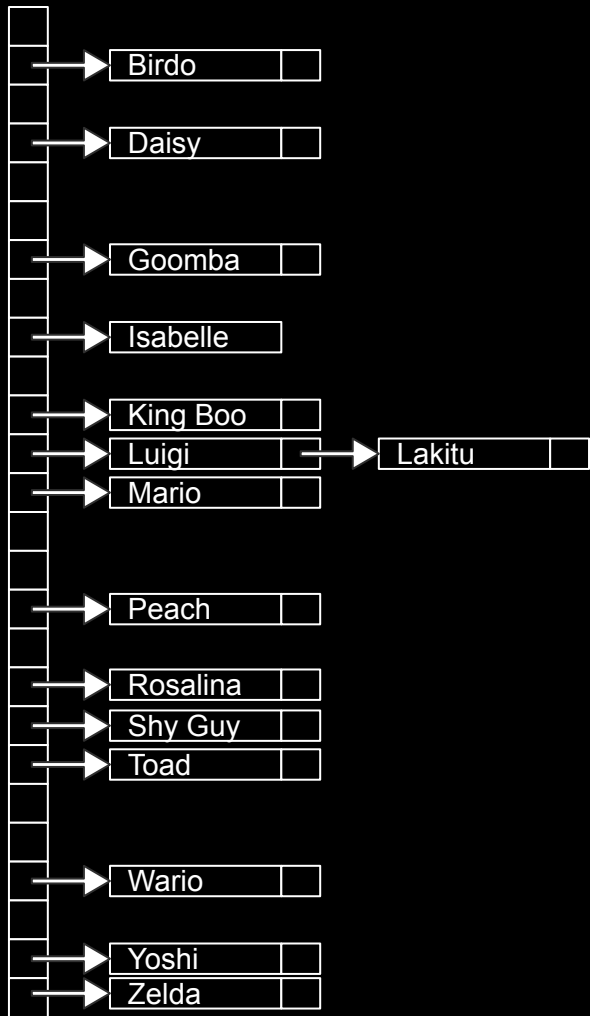
A	
B	
C	
D	
E	
F	
G	
H	
I	
J	
K	
L	
M	
N	
O	
P	
Q	
R	
S	
T	
U	
V	
W	
X	
Y	
Z	

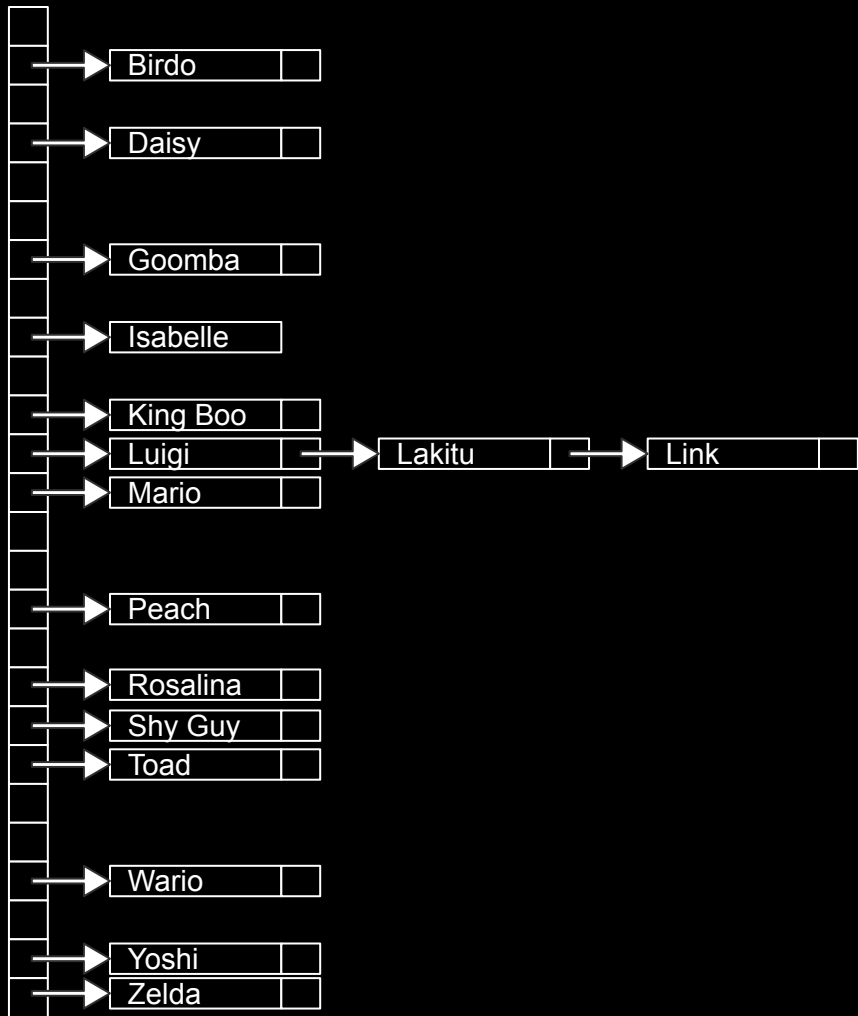


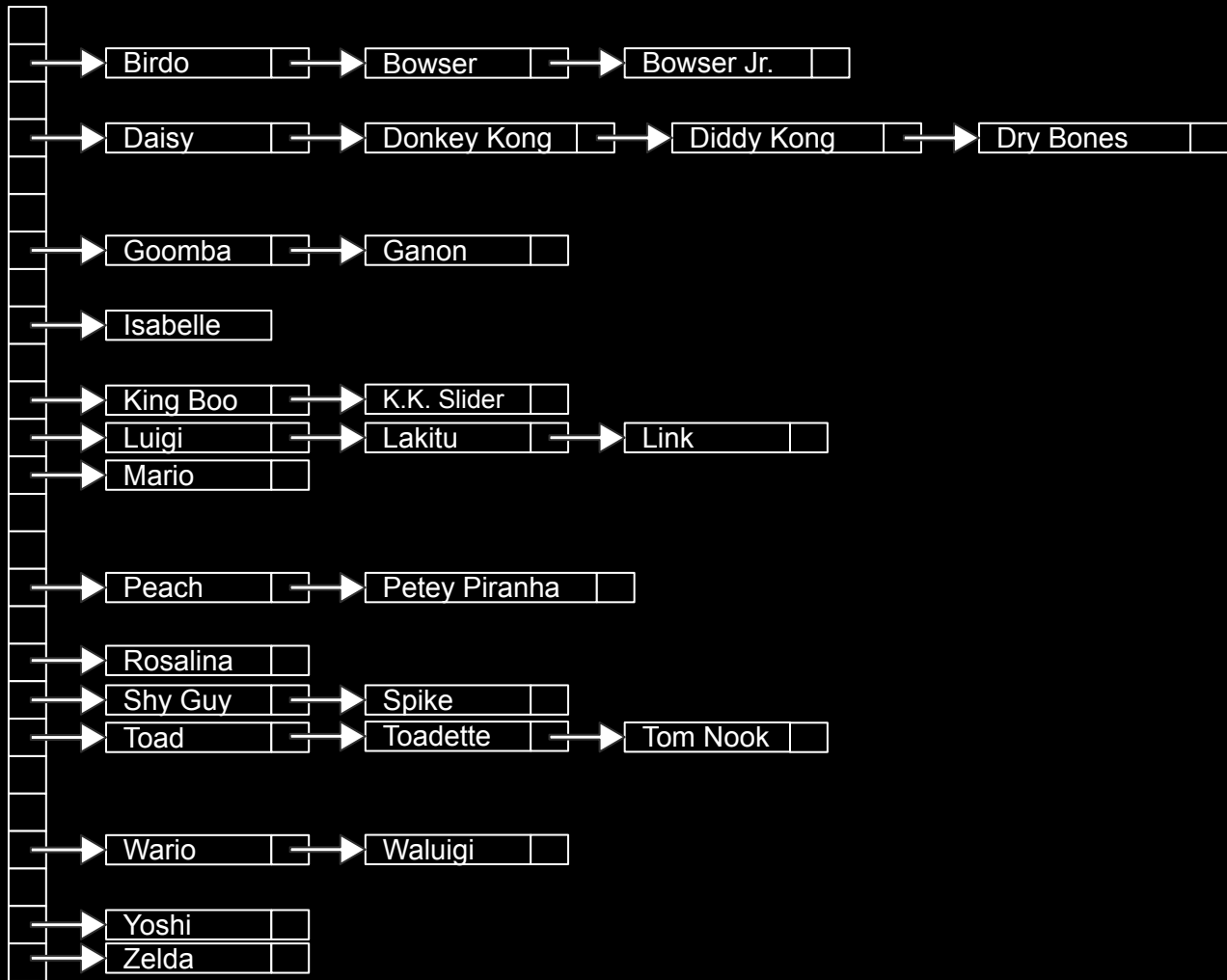




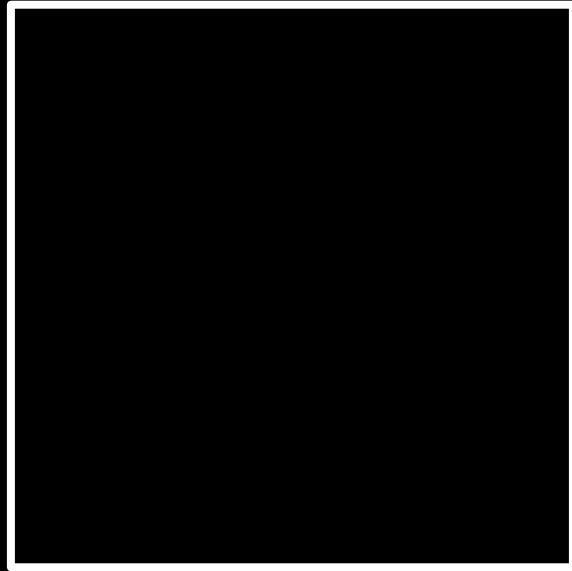








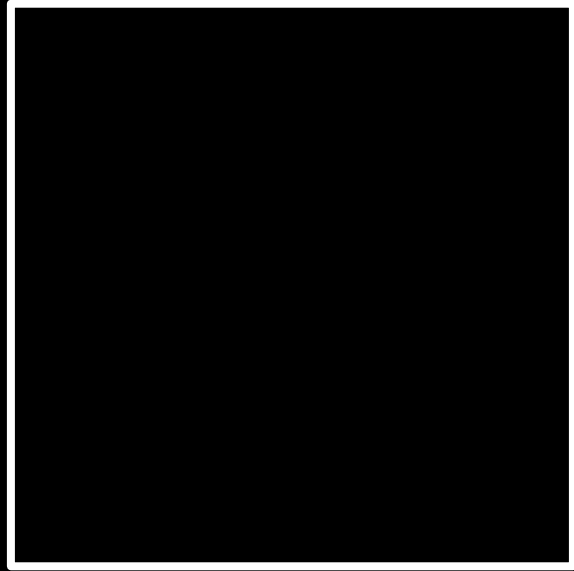
input →



→ output

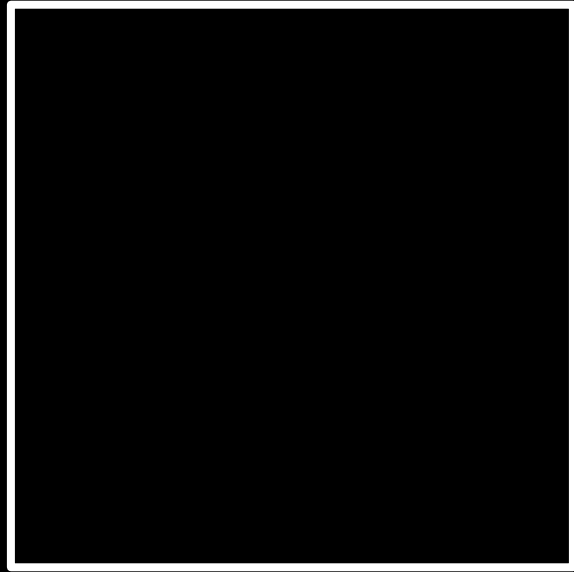
hash function

Mario →

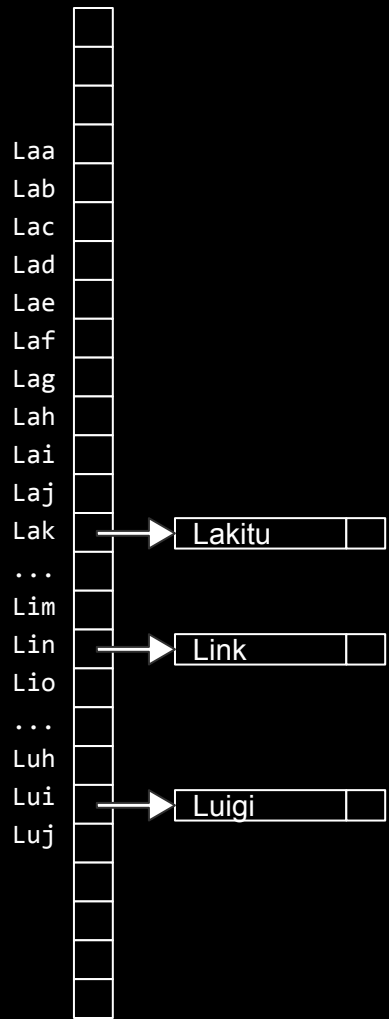


→ 12

Luigi →



→ 11



$O(n^2)$

$O(n \log n)$

$O(n)$

$O(\log n)$

$O(1)$

$O(n^2)$

$O(n \log n)$

$O(n)$ search

$O(\log n)$

$O(1)$

$O(n^2)$

$O(n \log n)$

$O(n)$ search

$O(\log n)$

$O(1)$ insert

dictionaries

dict

list

range

set

tuple

...

queues

stacks

Assignment 3

Office Hours

Lab 1

CS50 for MBAs

Data Structures