

Computational Thinking

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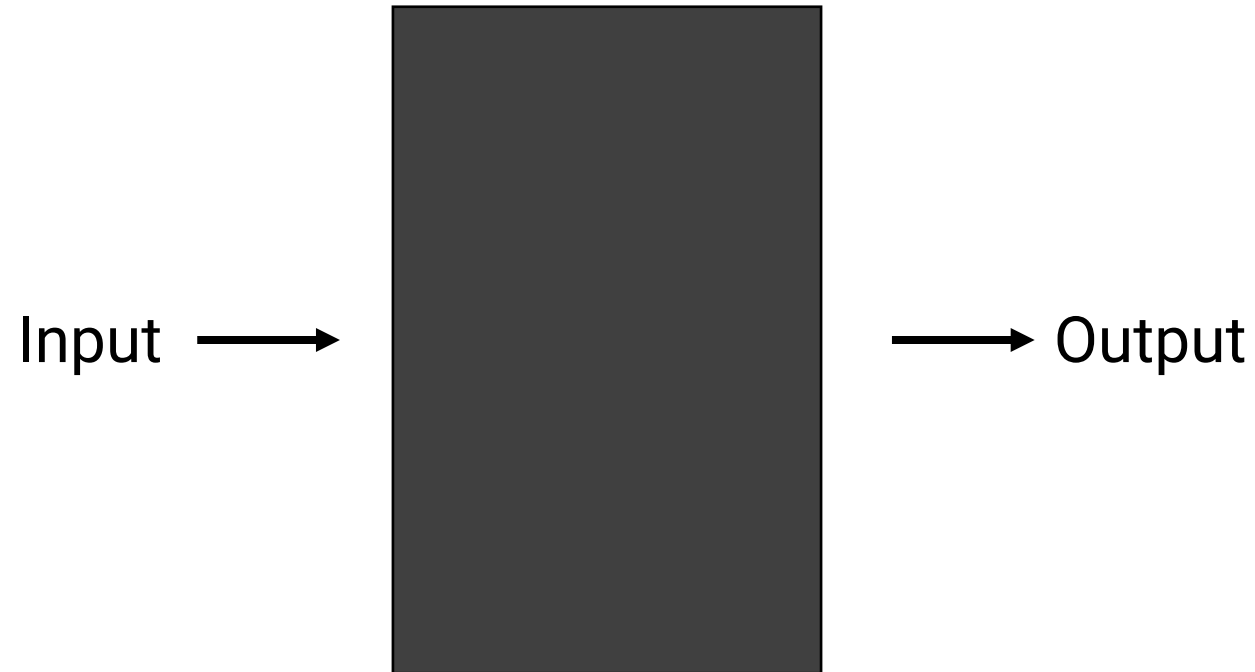
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CSC 1300: Introduction to Programming

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What is Computer Science?



Representation of Information

0 1 2 3 4 5 6 7 8 9

0 1

1 2 3

100 10 1
1 2 3

$100 * 1 + 10 * 2 + 1 * 1$

100 10 1
0 0 0

100 10 1
0 0 1

100 10 1
0 0 2

100 10 1
0 0 3

100 10 1
0 0 4

100 10 1
0 0 5

100 10 1
0 0 6

100 10 1
0 0 7

100 10 1
0 0 8

100 10 1
0 0 9

100 10 1
0 1 0

10^2 10^1 10^0
0 1 0

2^2 2^1 2^0
0 0 0

4 2 1
0 0 0

4 2 1
0 0 1

4 2 1
0 1 0

4 2 1
0 1 1

4 2 1
1 0 0

4 2 1
1 0 1

4 2 1
1 1 0

4 2 1
1 1 1

0 1 2 3 4 5 6 7

$2^n (-1)$

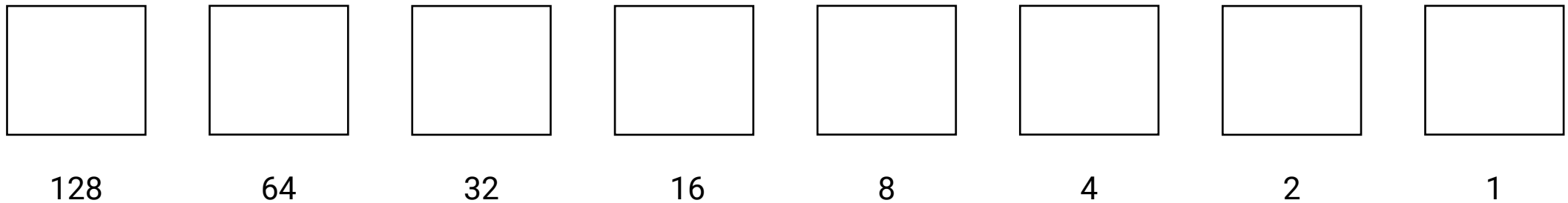
8?

Add another slot, also known as bits

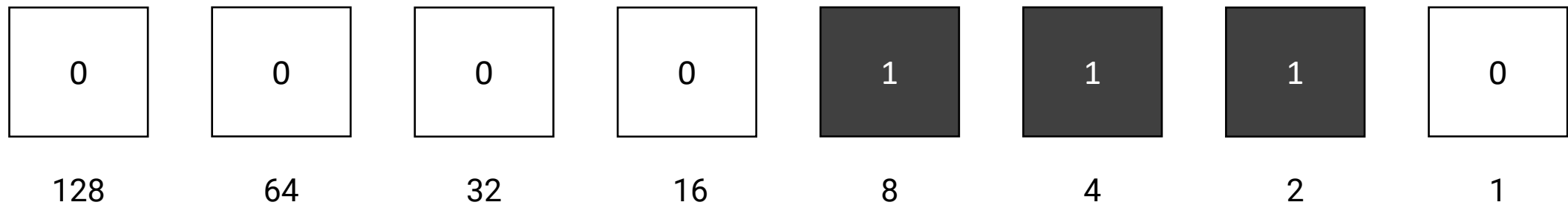
8 4 2 1
1 0 0 0

bytes

How does the number 14 is stored in a byte?

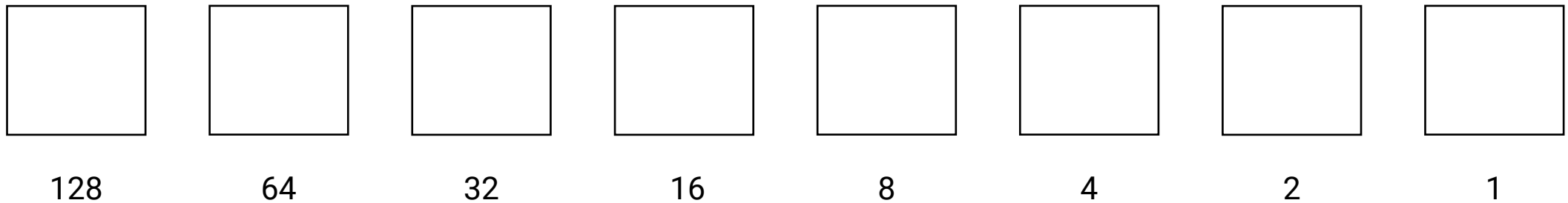


How does the number 14 is stored in a byte?

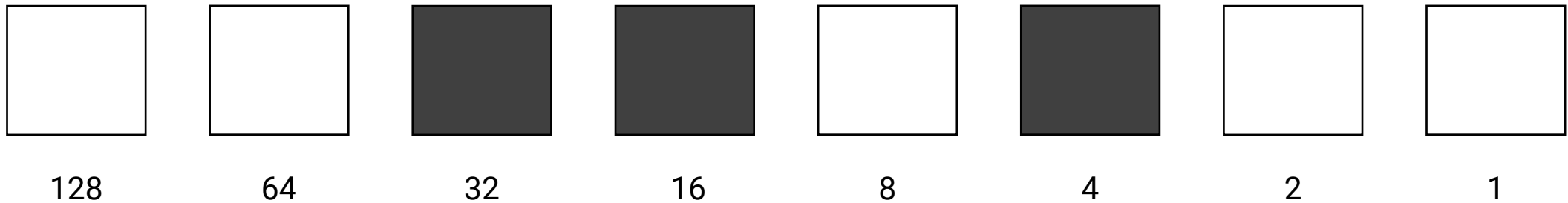


$$8 + 4 + 2 = 14$$

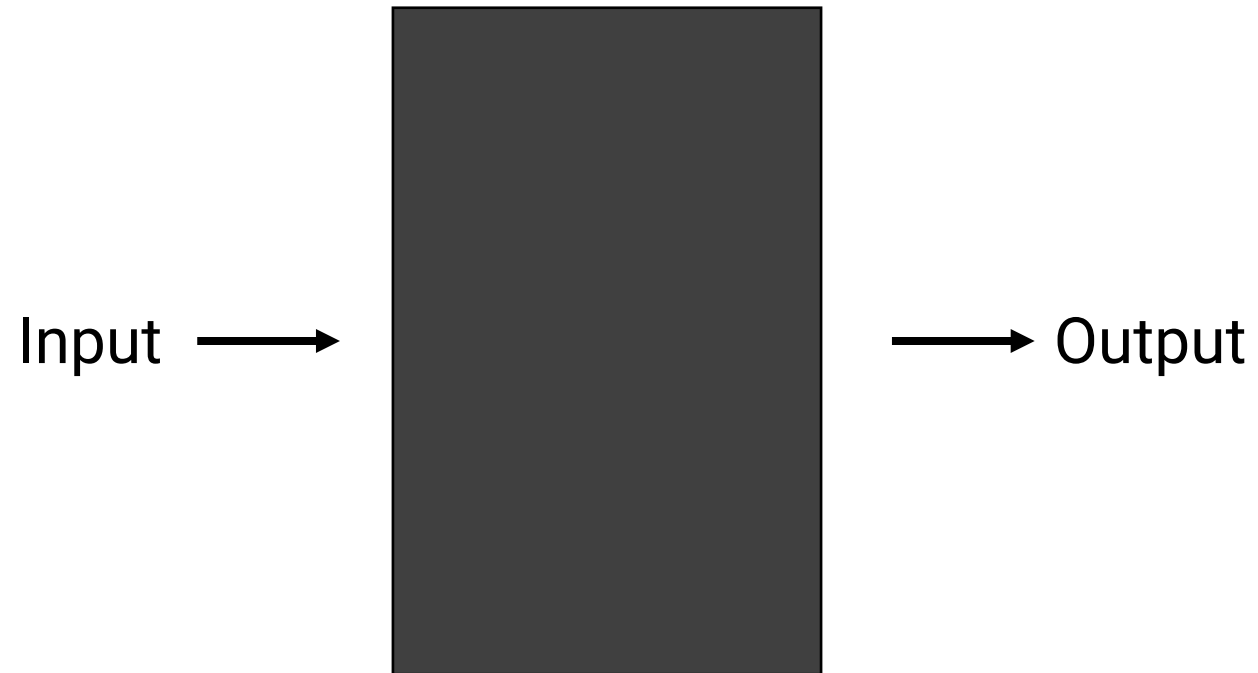
How does the number 52 is stored in a byte?

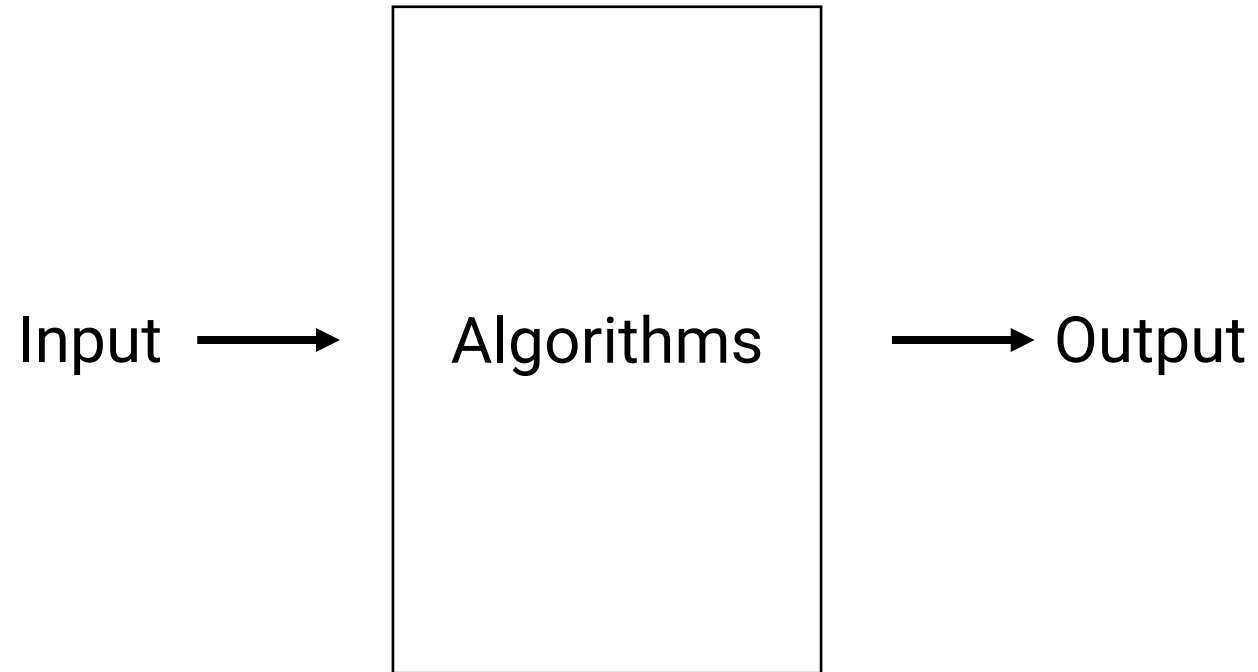


How does the number 52 is stored in a byte?



$$32 + 16 + 4 = 52$$





How should we approach in finding
“John Doe” in an Contact Directory?

1024

1024

512

1024

512

256

1024

512

256

128

1024

512

256

128

64

1024

512

256

128

64

32

1024

512

256

128

64

32

16

1024

512

256

128

64

32

16

8

1024

512

256

128

64

32

16

8

4

1024

512

256

128

64

32

16

8

4

2

1024
512
256
128
64
32
16
8
4
2
1

