CHAPTER 2

BINARY NUMBERS

QUIZ

5 MIN

CLASS

COMPETITION

Powers of 2

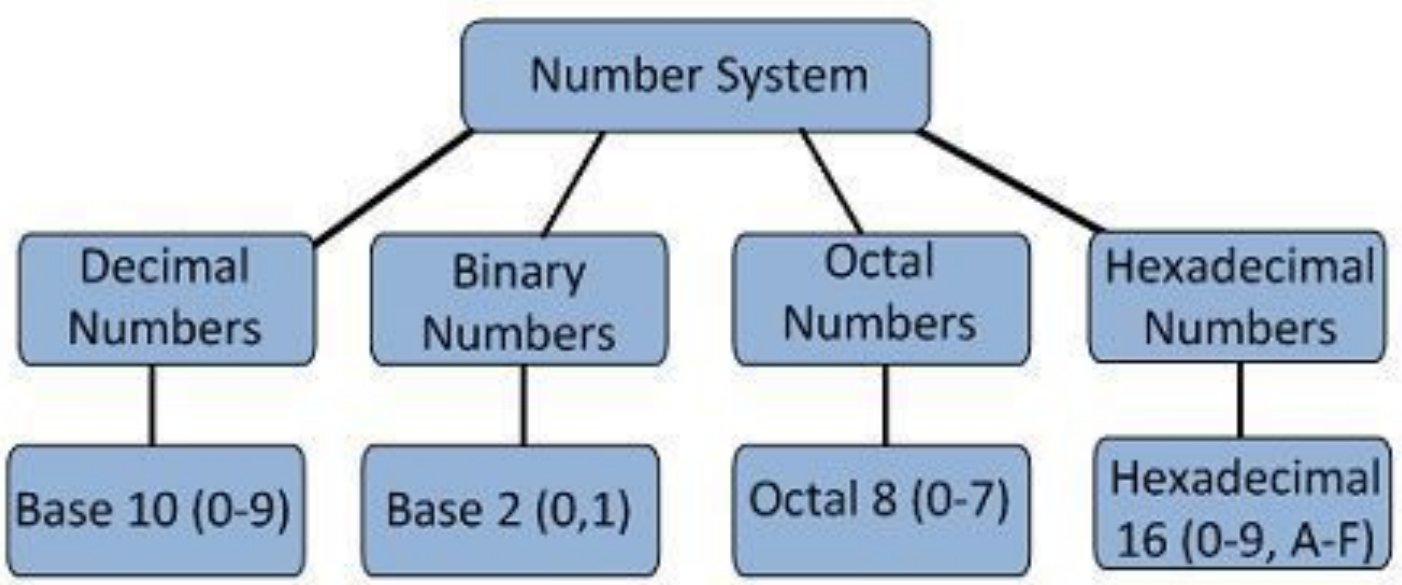
2

64

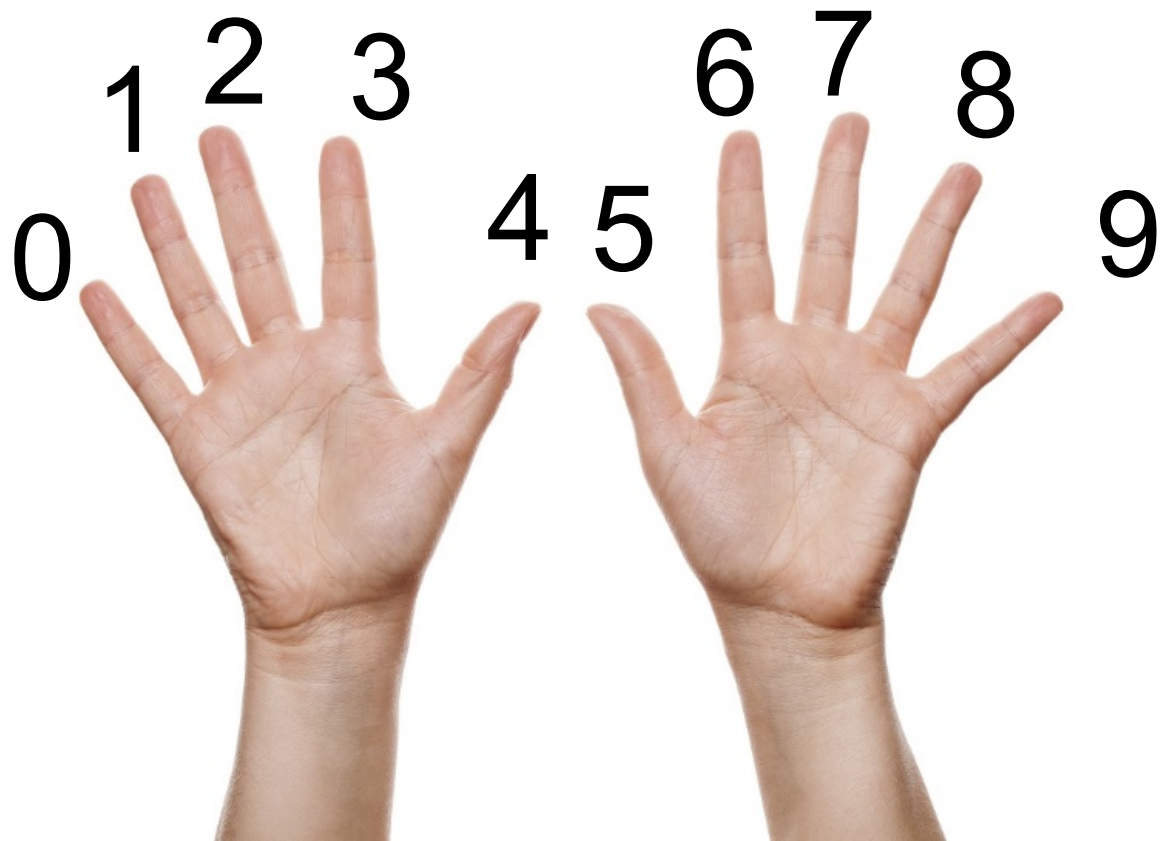
128

A Numeral System is a writing system for expressing numbers

Some example of Number Systems:

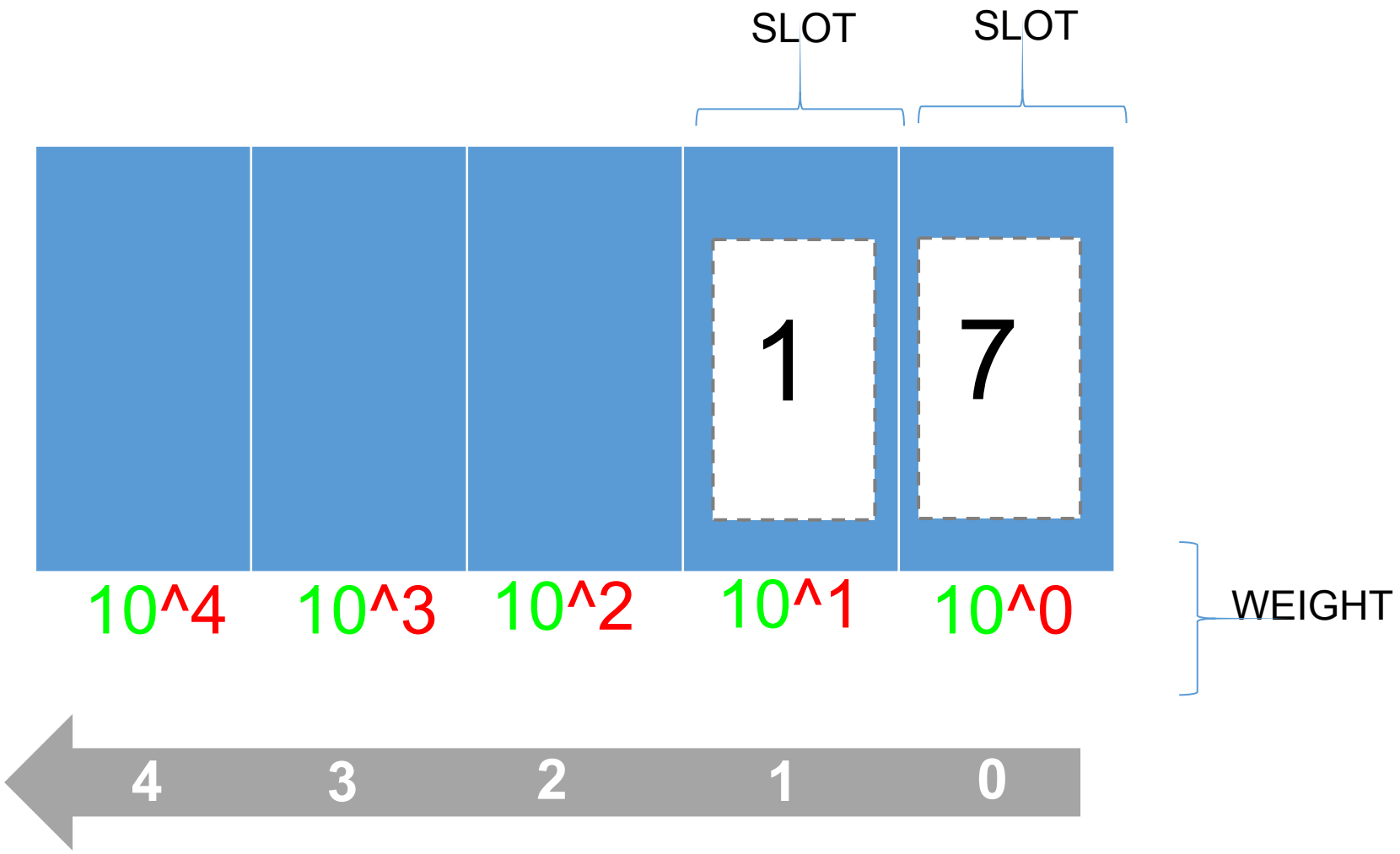


A **decimal** value is expressed with 10 digits



Each slot has a weight (*powers of 10*)

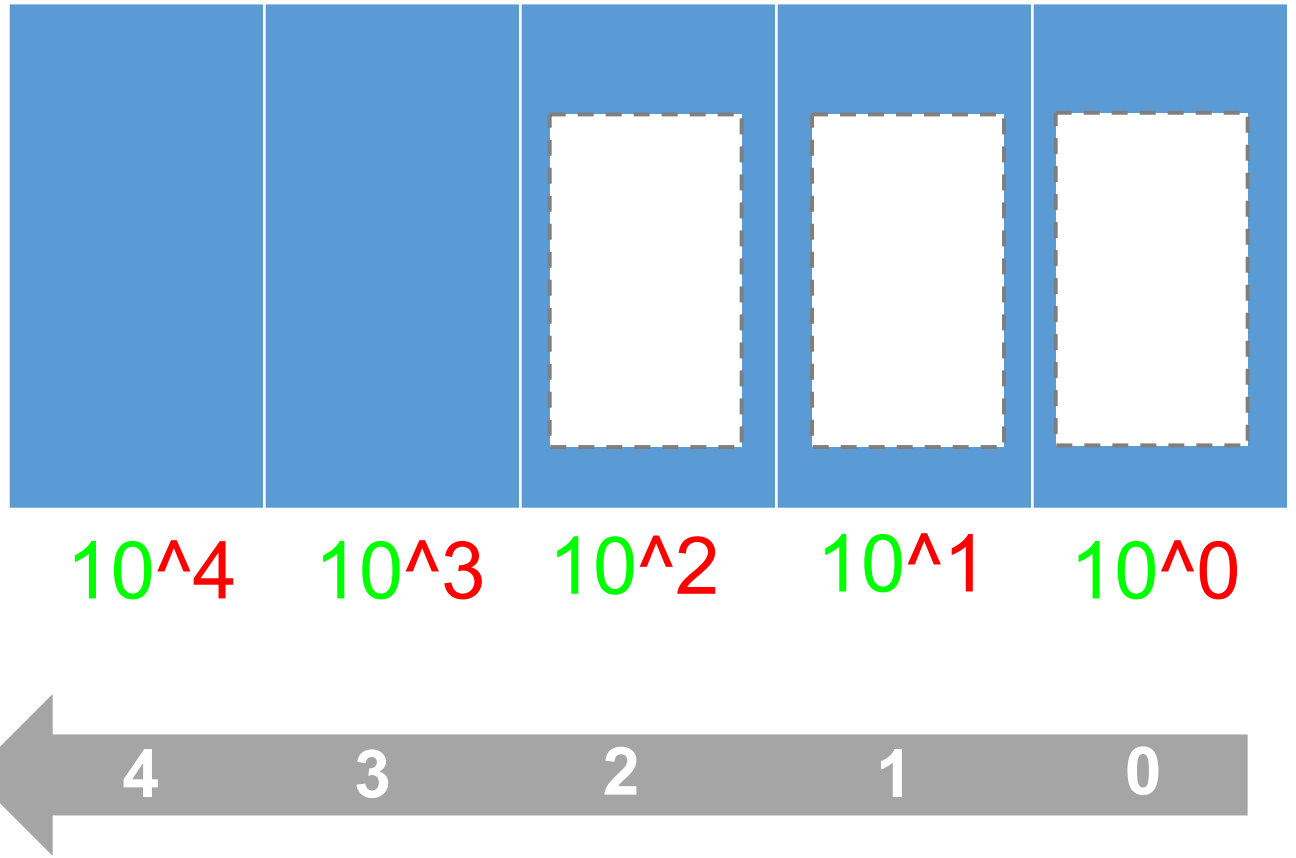
17 = 1*10^1 + 7*10^0



COLLECTIVE

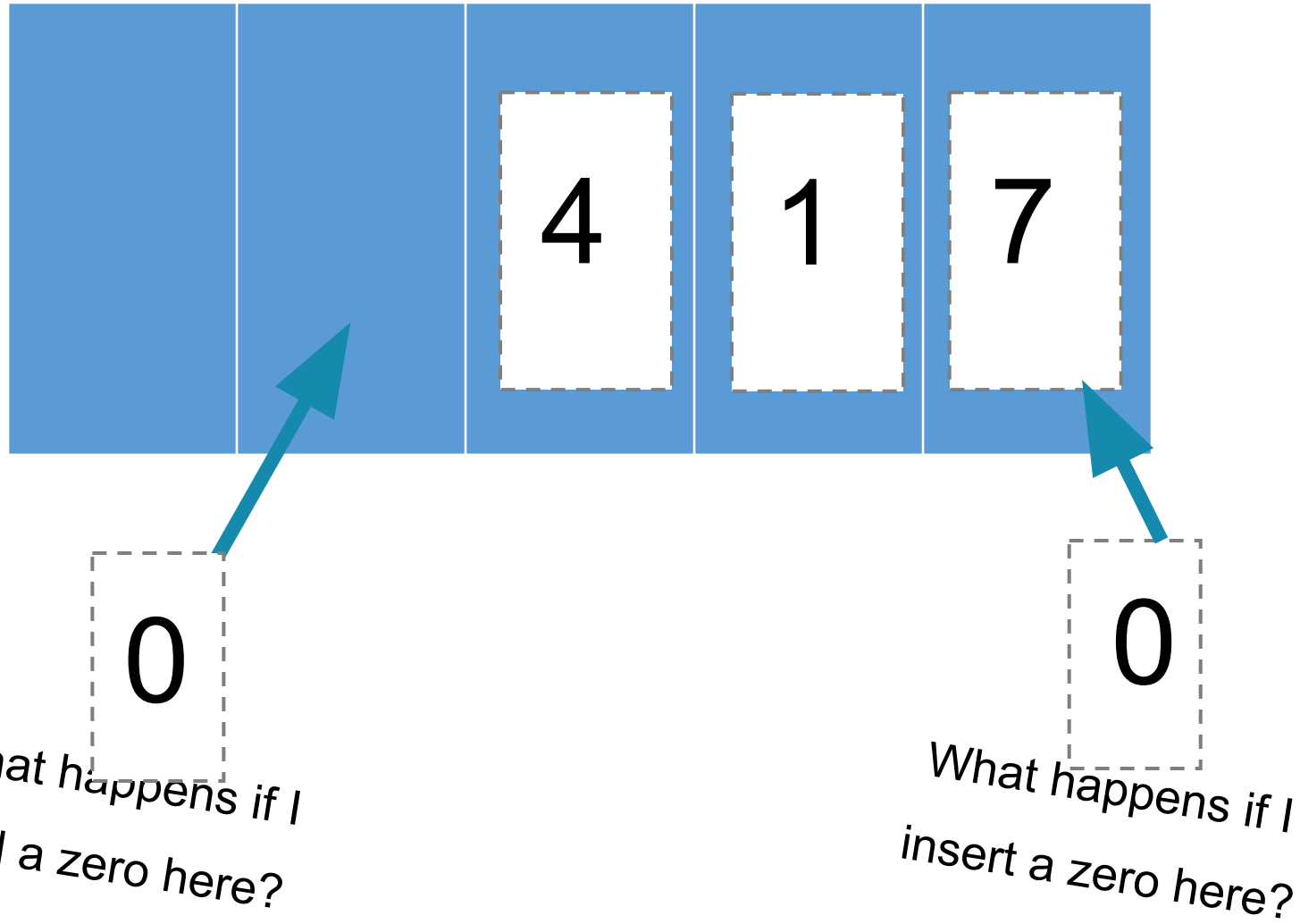
CLASS

With 3 slots, how many numbers **can we express** in decimal system?

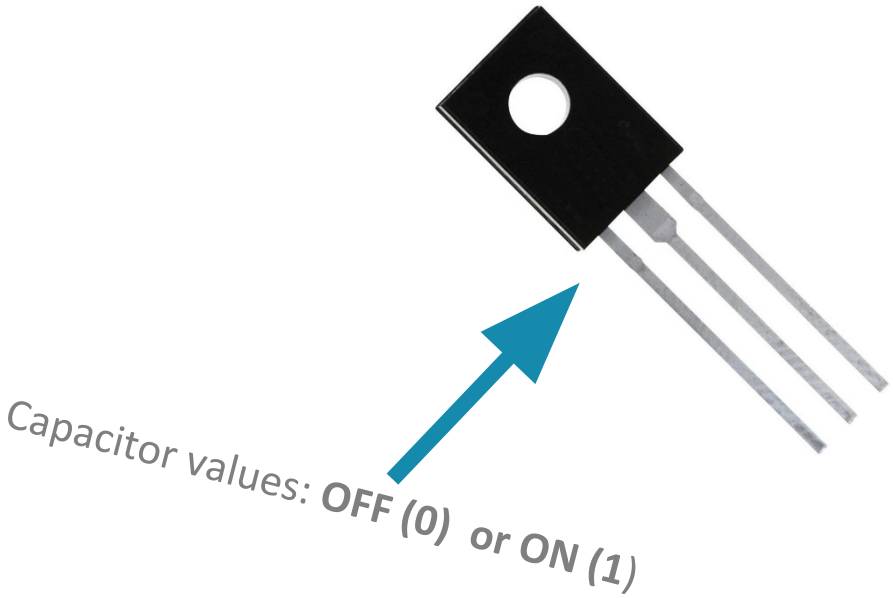


COLLECTIVE

CLASS

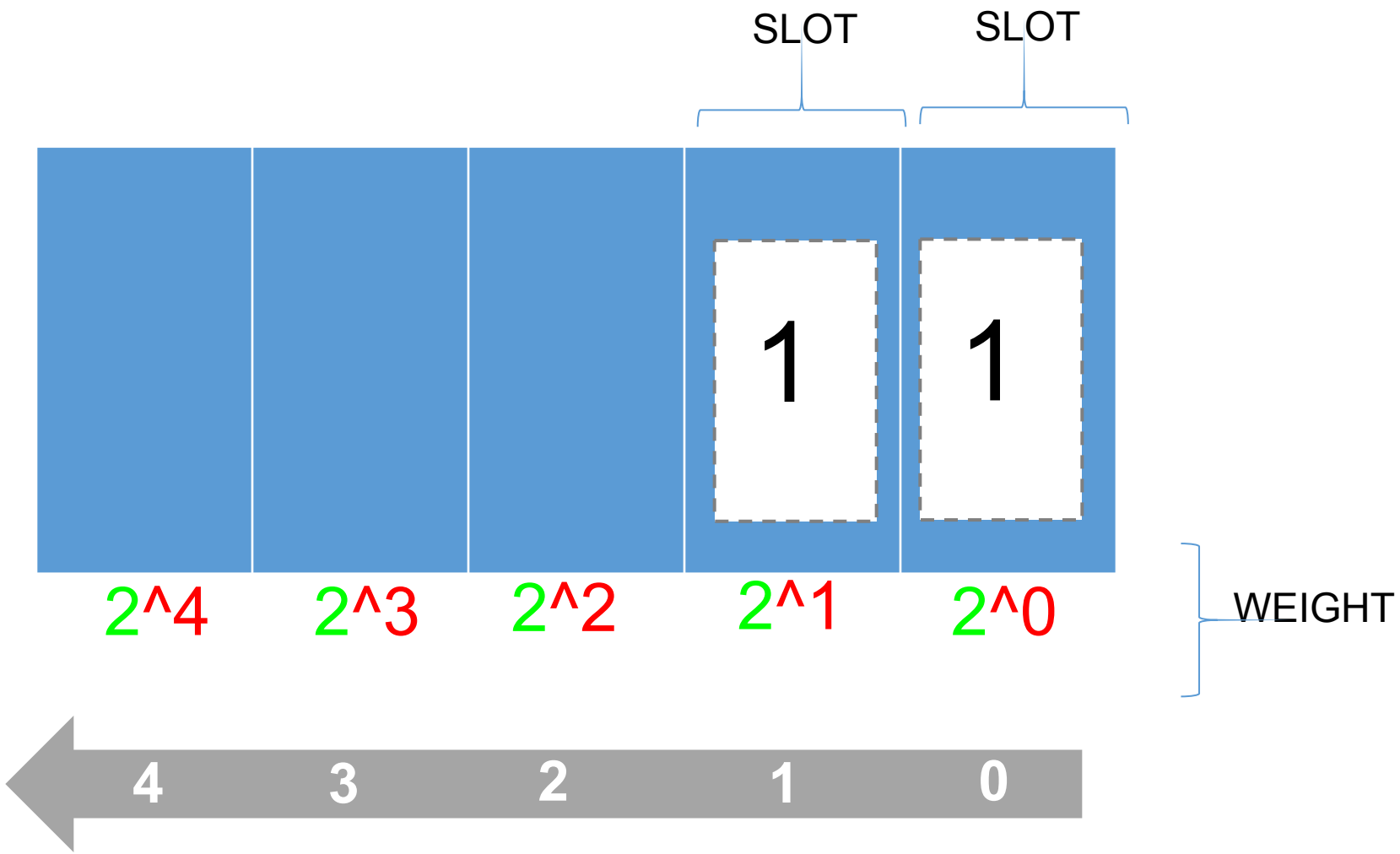


“binary” is a number system using **only 2 digits**



Each slot has a weight (*powers of 2*)

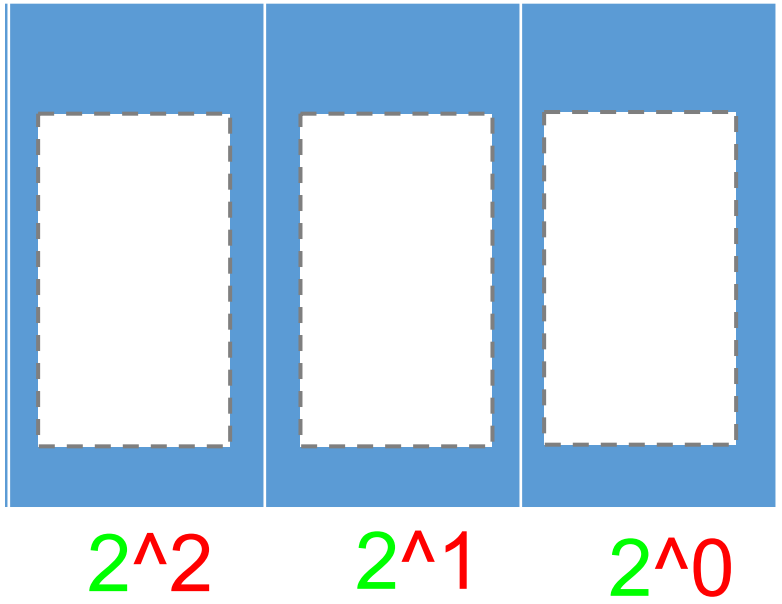
3 = 1*2^1 + 1*2^0



COLLECTIVE

CLASS

With 3 slots, how many numbers **can we express** in binary system?



COLLECTIVE

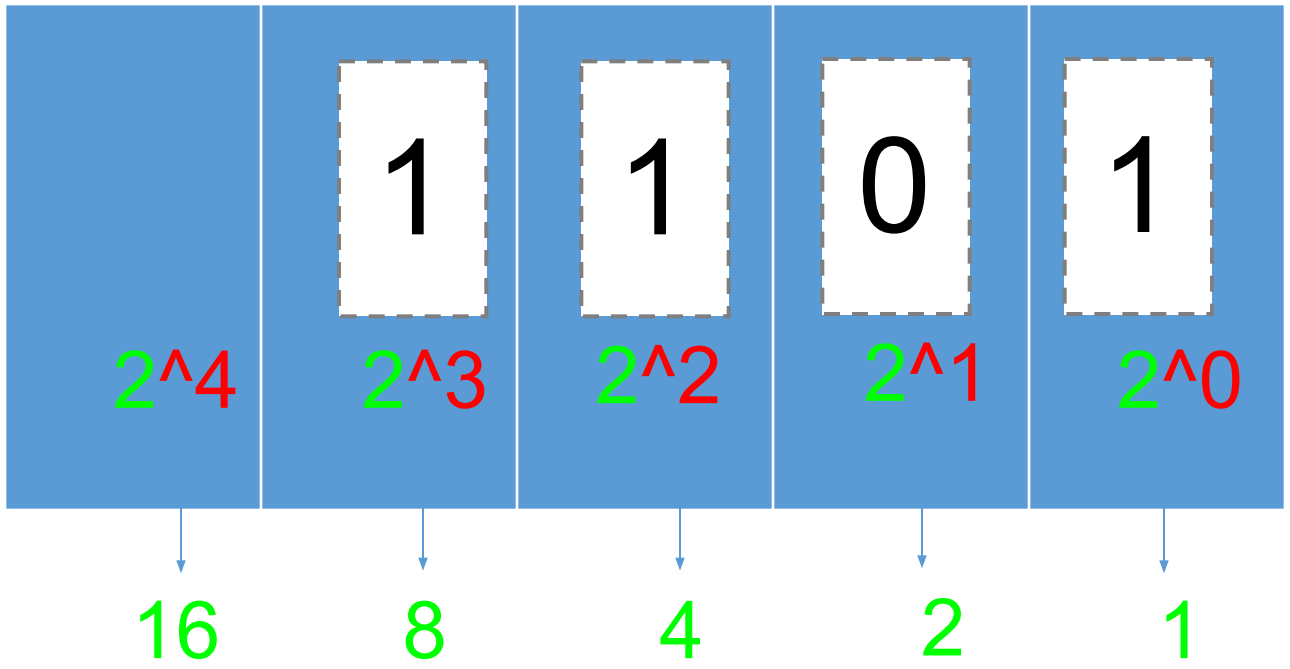
CLASS

What is the value of this number ?

	1	1	0	1
2^4	2^3	2^2	2^1	2^0

SOLUTION

What is the value of this number ?



8 * 1 + 4 * 1 + 2 * 0 + 1* 1 = 13

10 MIN

GROUPS OF 5

Game !!!

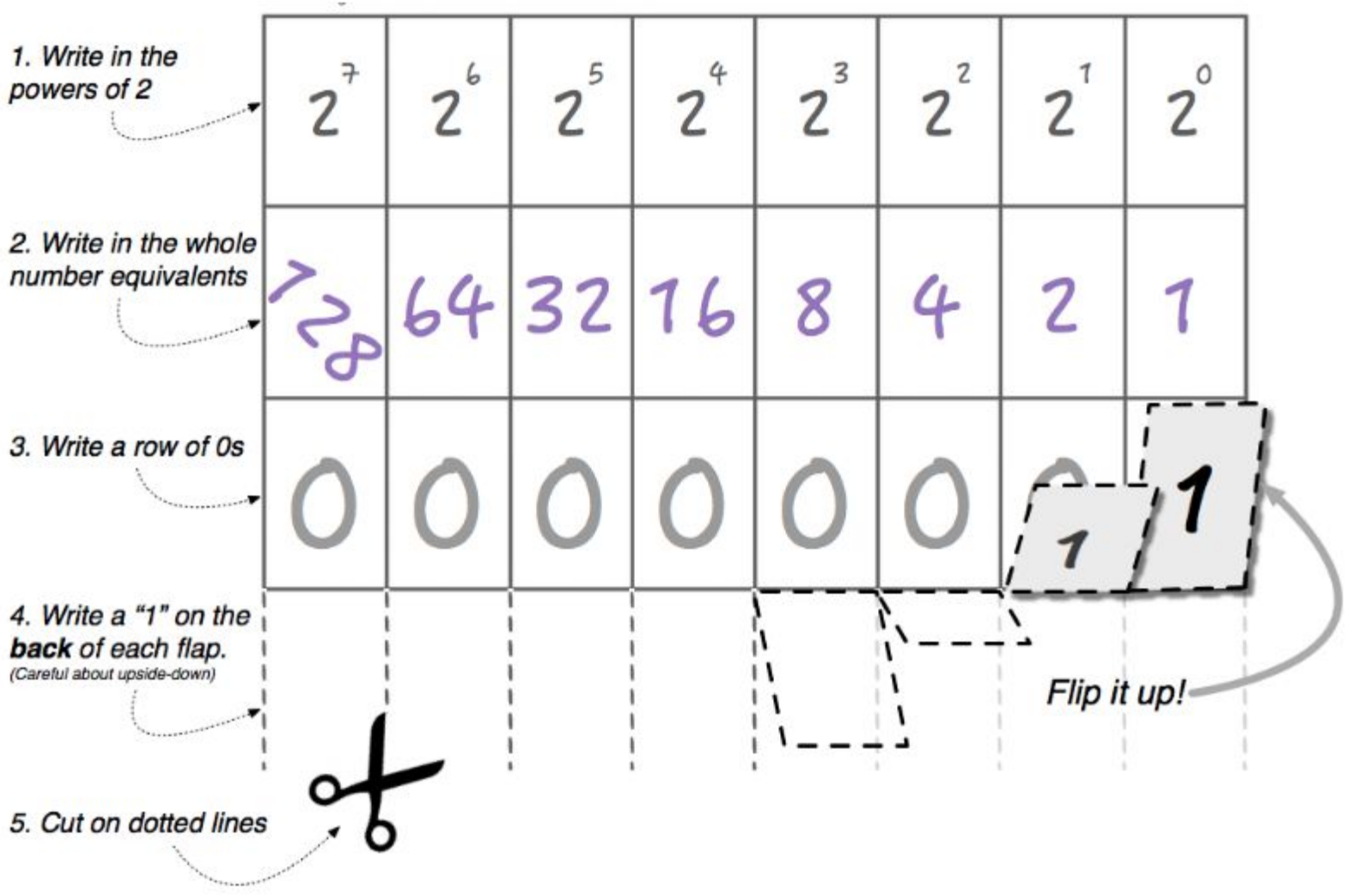
1	0	1	0	1
*16	*8	*4	*2	*1

PRACTICE

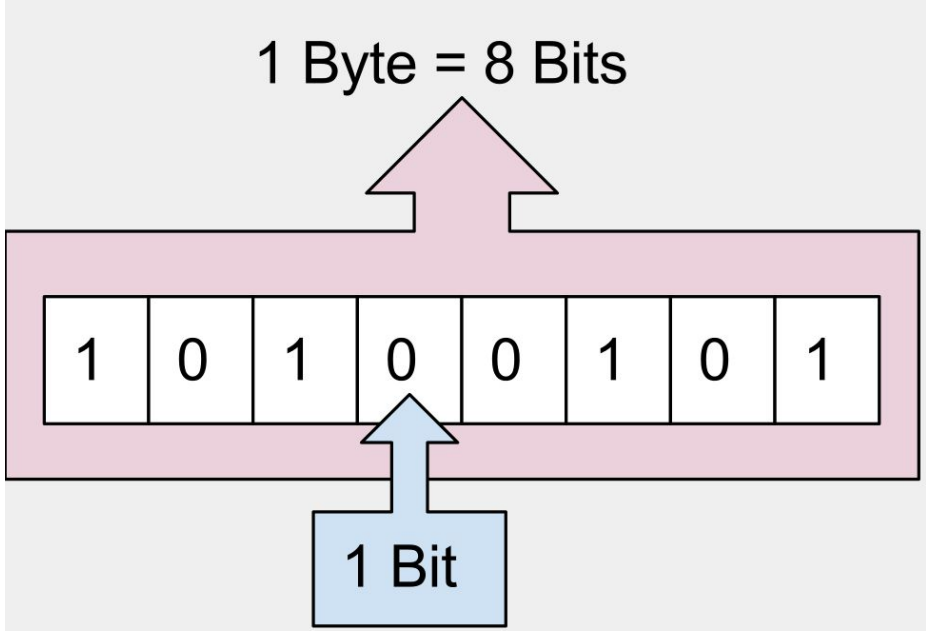
30 MIN

INDIV

Complete your **flippy** & do the **exercises**



More than a bit, **a BYTE** !



1 byte	= 8 bits
1 kilobyte	= 1024 bytes
1 megabyte	= 1024 kilobyte
1 gigabyte	= 1024 megabyte
1 terabyte	= 1024 gigabyte

WRAP UP

What did we learn today?

Decimal number: a base 10 number with ten possible different digits

0 1 2 3 4 5 6 7 8 9

10^1	10^0
10	1
2	3

Same number represented two different ways.

← Decimal Binary →

Binary number: a base 2 number with two possible different digits

0 1

2^4	2^3	2^2	2^1	2^0
16	8	4	2	1
1	0	1	1	1

HOMEWORK

INDIV

Count in **base 11** !!