CHAPTER 2

ENCODING HEXA/BINARY

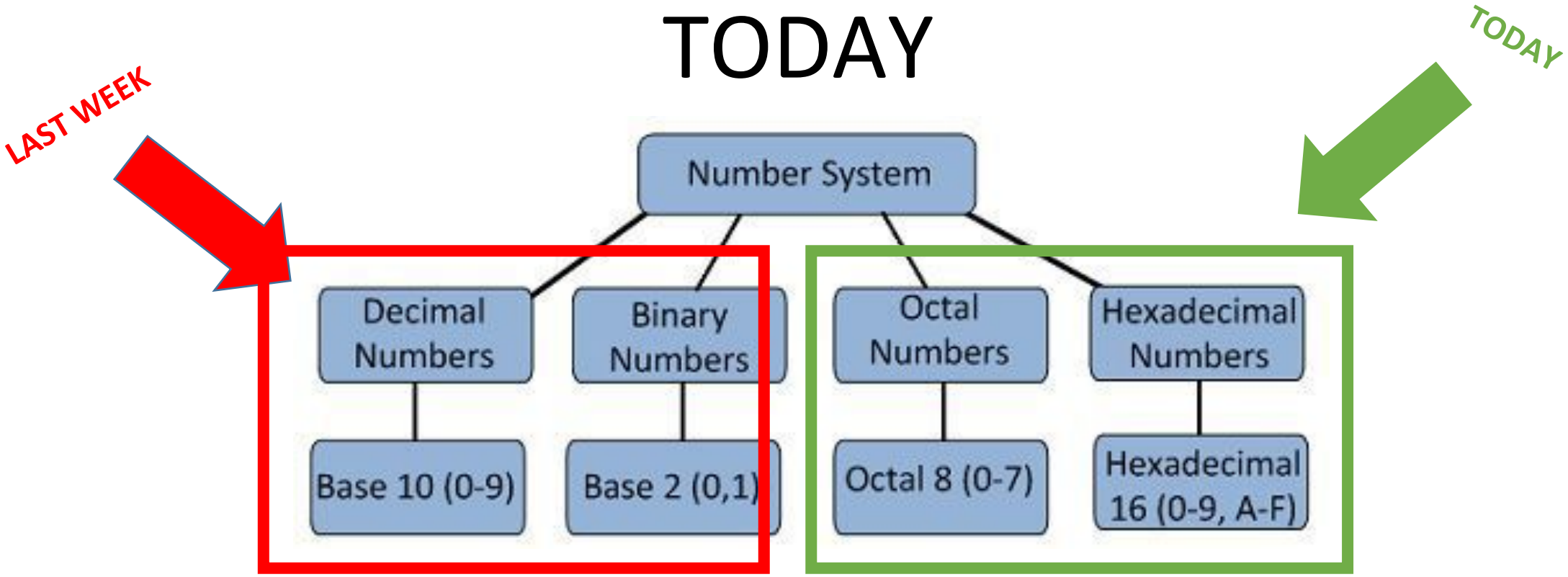
HOMEWORK

15 MIN

HOMEWORK REVIEW

Just 1 example per question !!

OBJECTIVES FOR TODAY

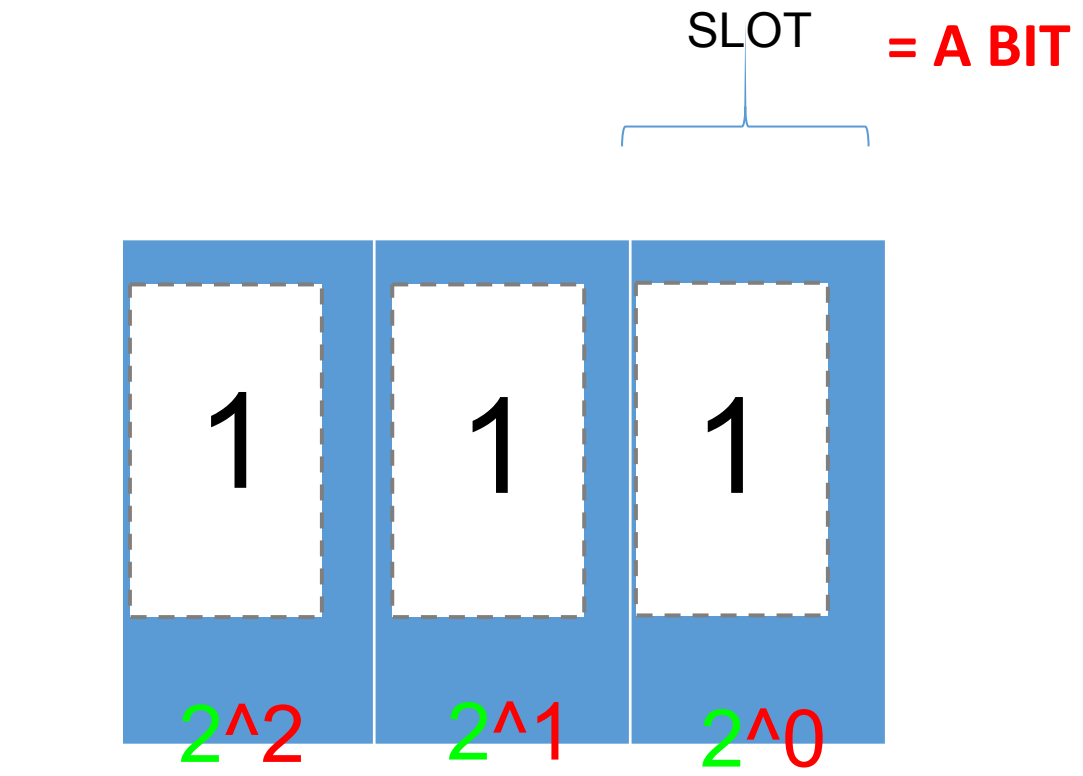


✔ Be able to write values in **binary** / octal / hexadecimal bases

PRESENTATION

CLASS

In base 2 (binary), a **slot** is called a **bit**



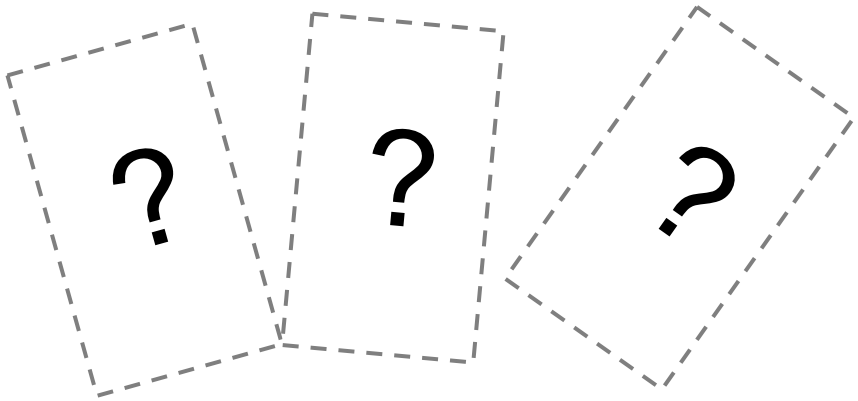
DISCUSSION

5 MIN

GROUP 2

How **many bits** to you need to express

A DAY OF THE WEEK



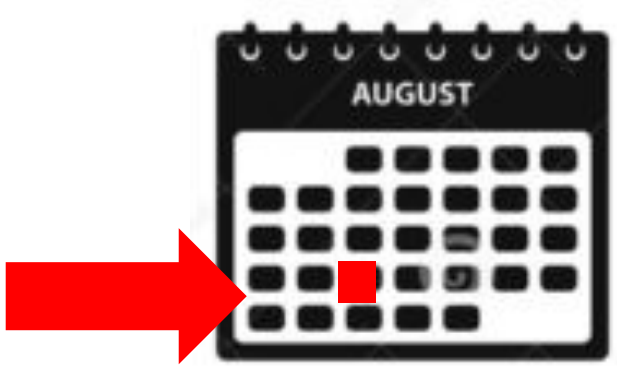
DISCUSSION

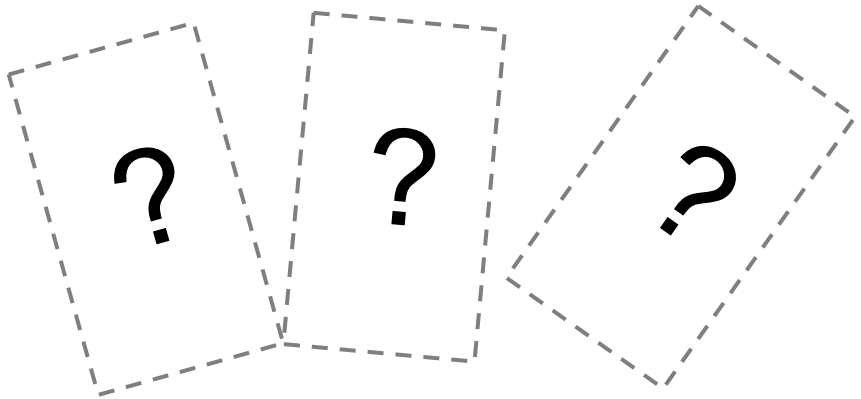
5 MIN

GROUP 2

How **many bits** to you need to express

A DAY OF THE MONTH ?





DISCUSSION

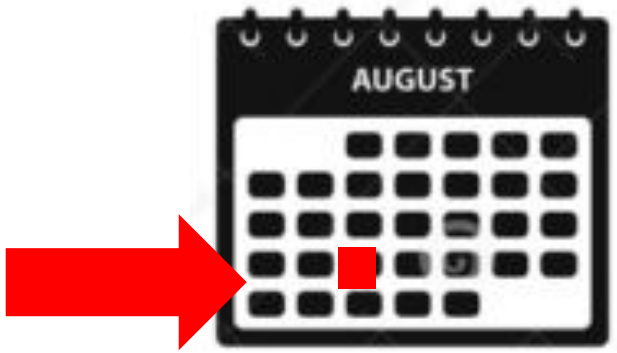
5 MIN

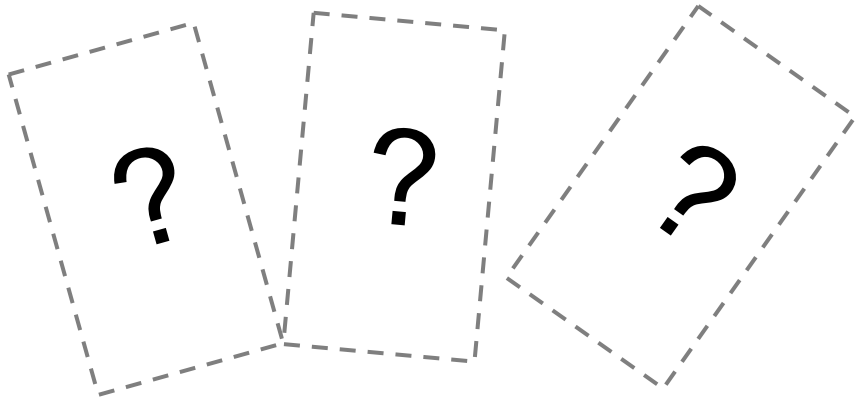
GROUP 2

How **many bits** to you need to express

A DAY OF THE YEAR?

From 1 to 365

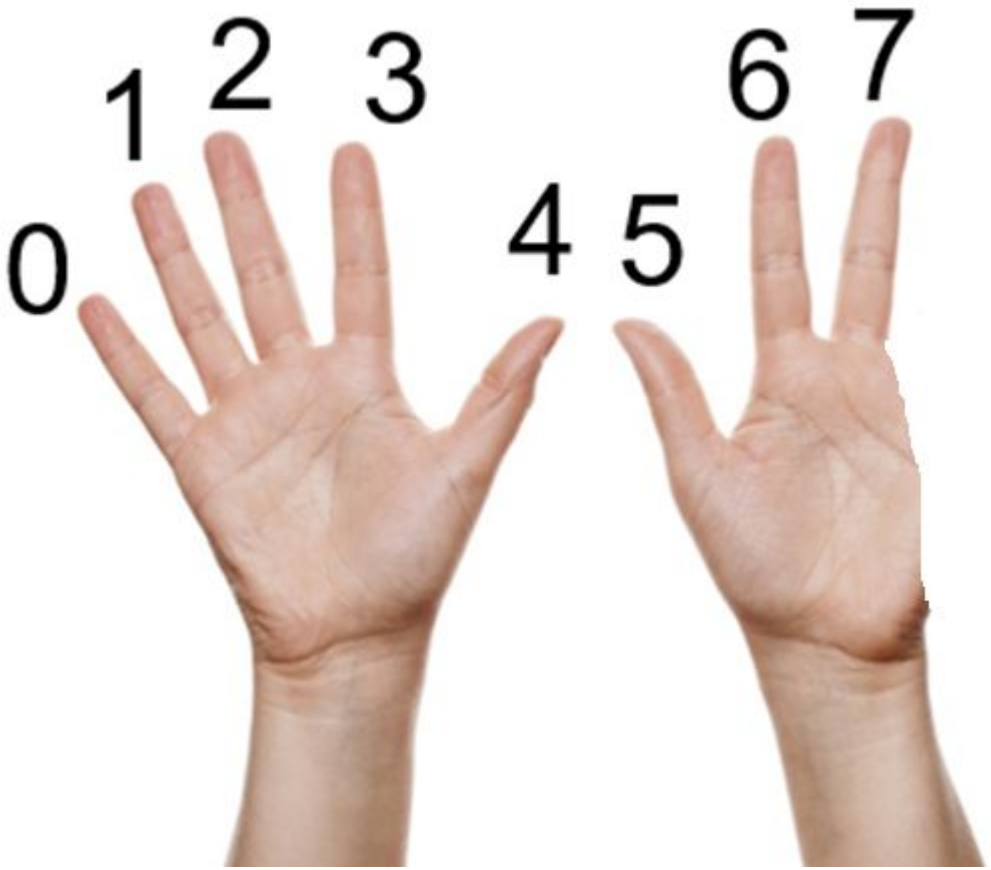




PRESENTATION

CLASS

An **octal** value is expressed with 08 digits

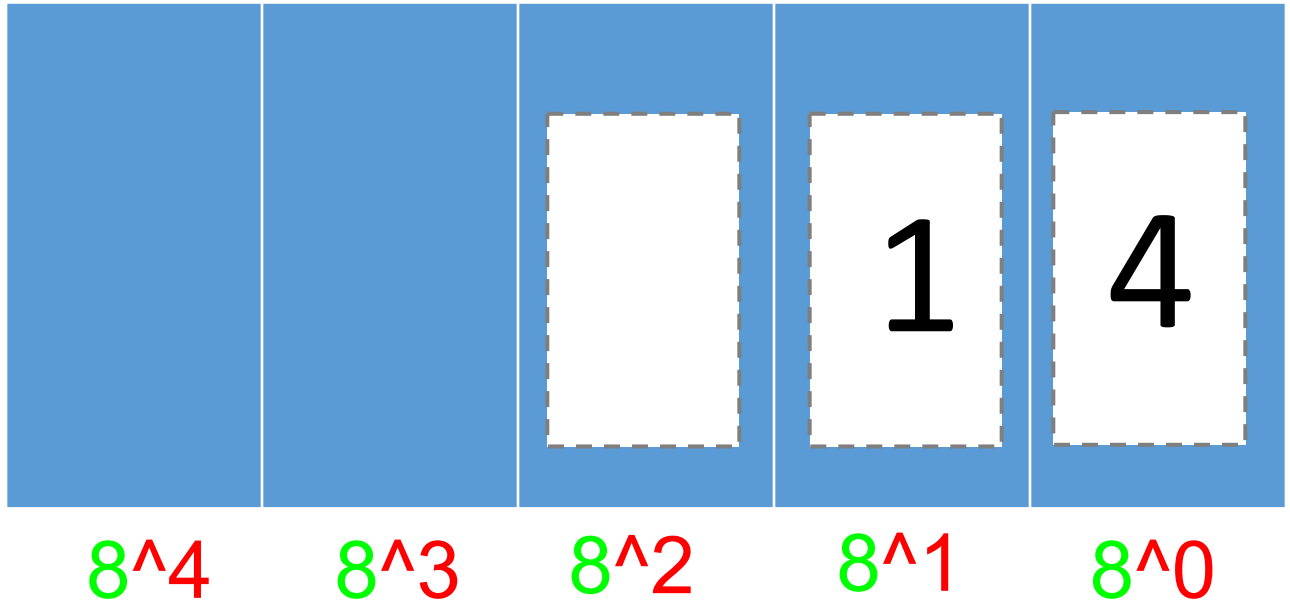


Each SLOT contains values from 0 to 7

PRESENTATION

CLASS

Base 8 (octal) to **Base 10** (decimal)



14

BASE 8

= 1*8^1 + 4*8^0

= 8 + 4

= 12

BASE 10

QUESTION

5 MIN

ONE

Convert this number to **base 10**

251

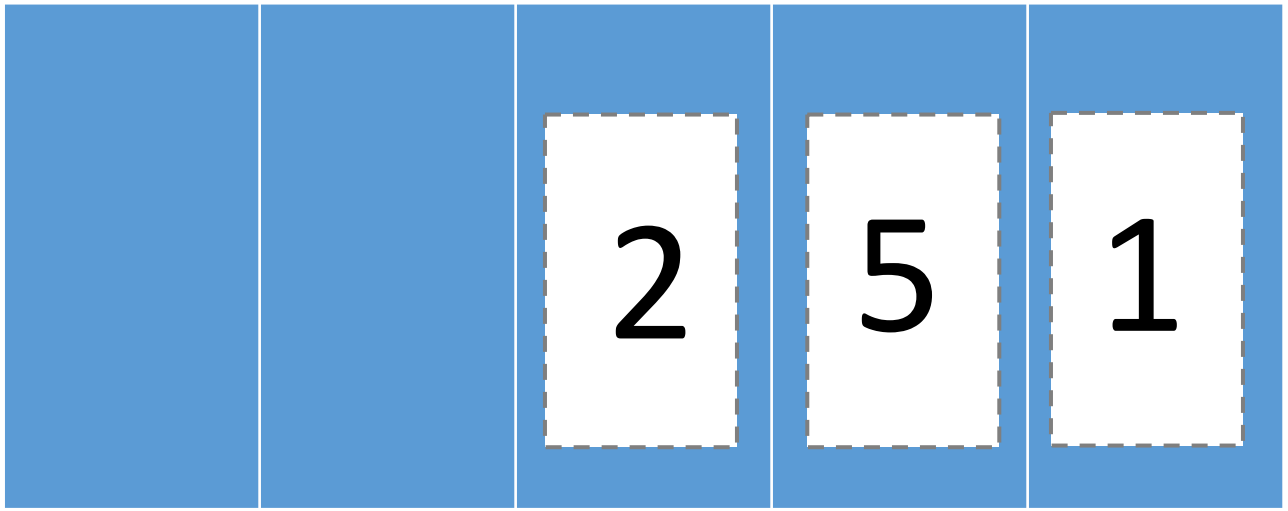
BASE 8

=

=

=

BASE 10



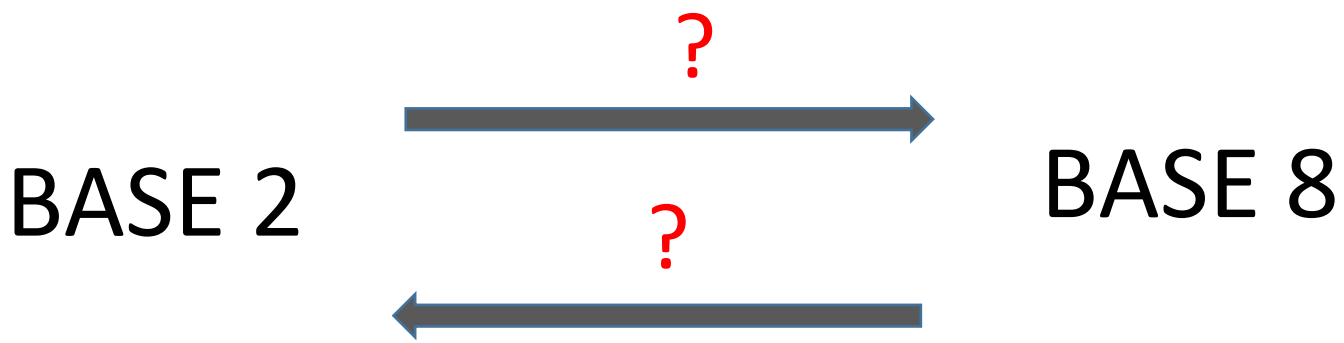
DISCUSSION

10 MIN

GROUP 2

Problem solving

How to convert binary number to octal number?



Q1 : How many **bits** (slots in base 2) do you need to convert an **octal** (1 slot in base8) ?

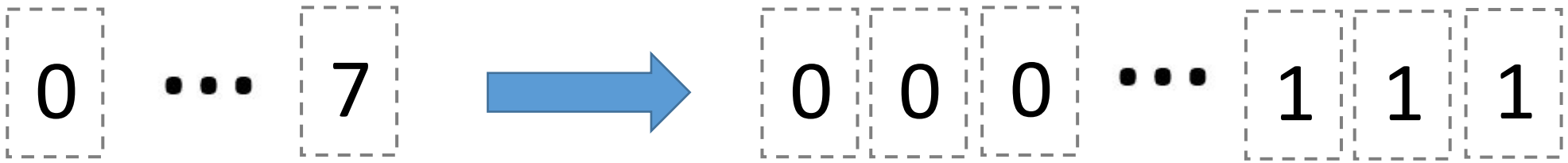
Q2 : **Find a way t**o convert a number in base 2 to a number in base 8

Q3 : **Find a way t**o convert a number in base 8 to a number in base 2

SOLUTION !

CLASS

Q1 : How many **bits** (slots in base 2) do you need to convert an **octal** (1 slot in base8) ?

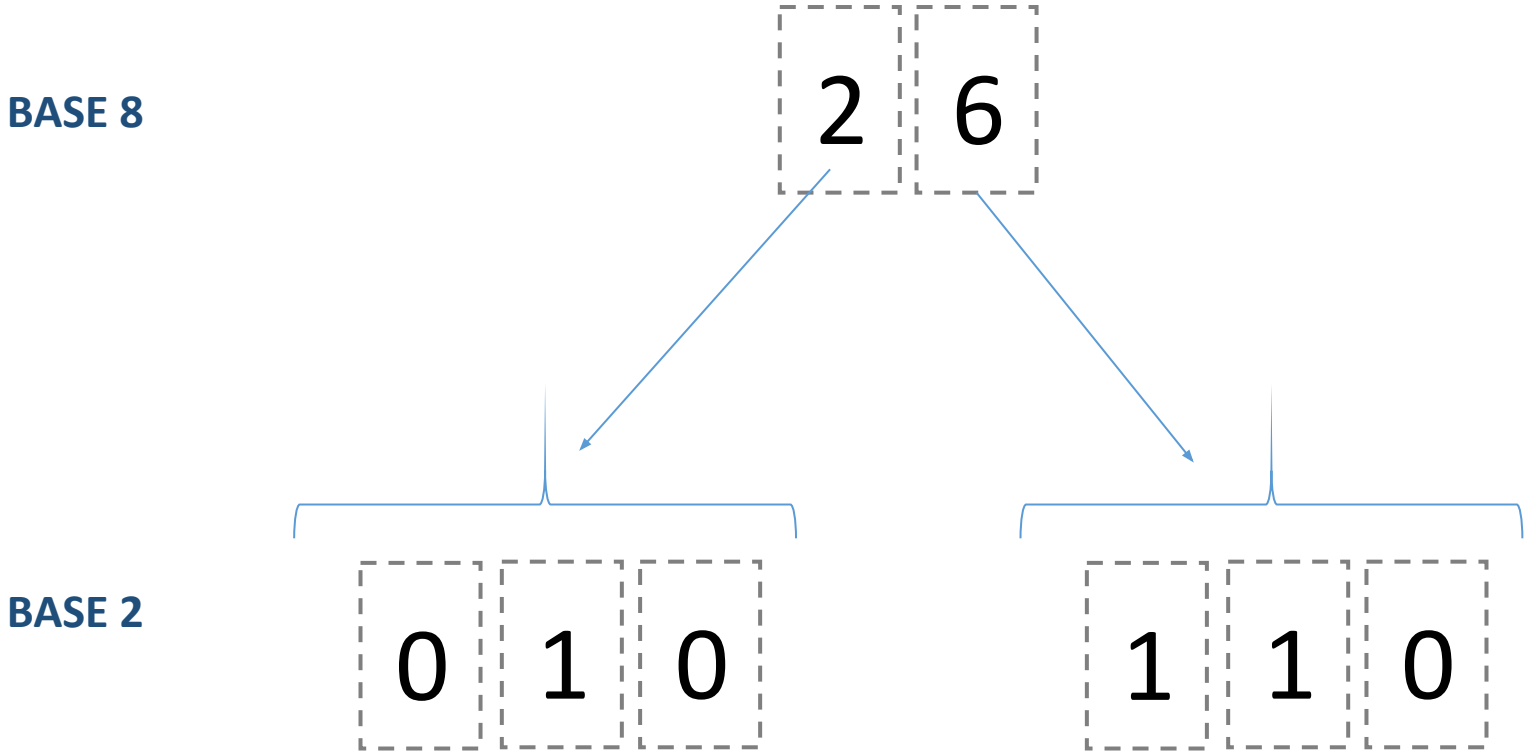


One slot in **base8** needs 3 slots in **base2**

SOLUTION !

CLASS

Q2 : **Find a way t**o convert a number in base 8 to a number in base 2



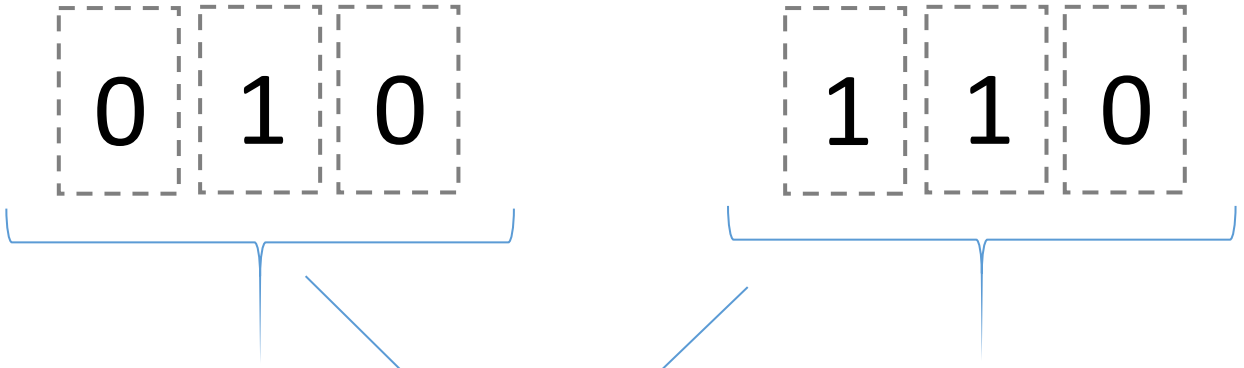
So : $(26)_{base8}$? $(010110)_{base2}$

SOLUTION !

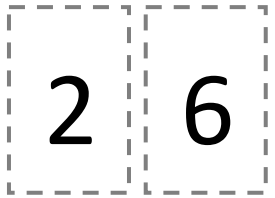
CLASS

Q3 : **Find a way t**o convert a number in base 2 to a number in base 8

BASE 2



BASE 8

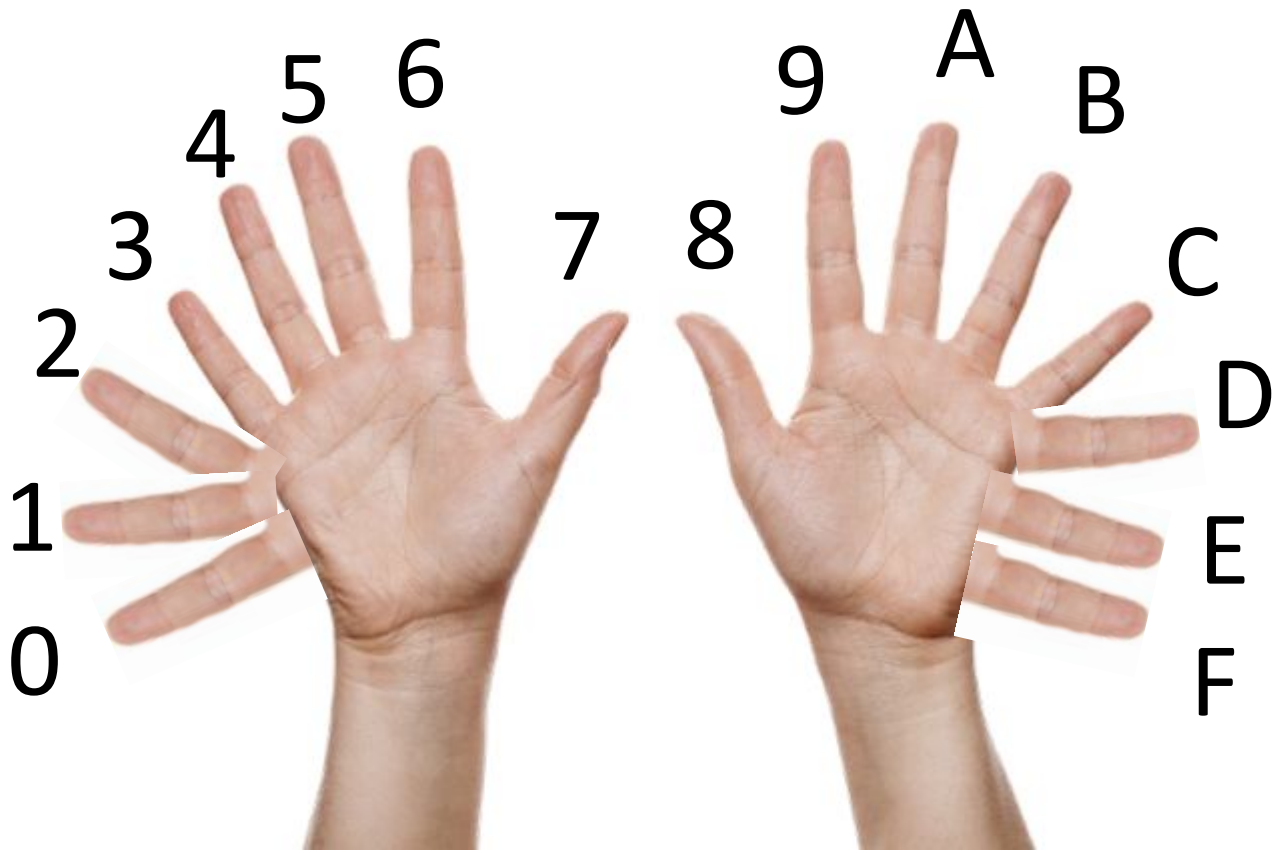


So : $(010110)_{base2}$? $(26)_{base8}$

PRESENTATION

CLASS

An **hexadecimal** value is expressed with 16 digits



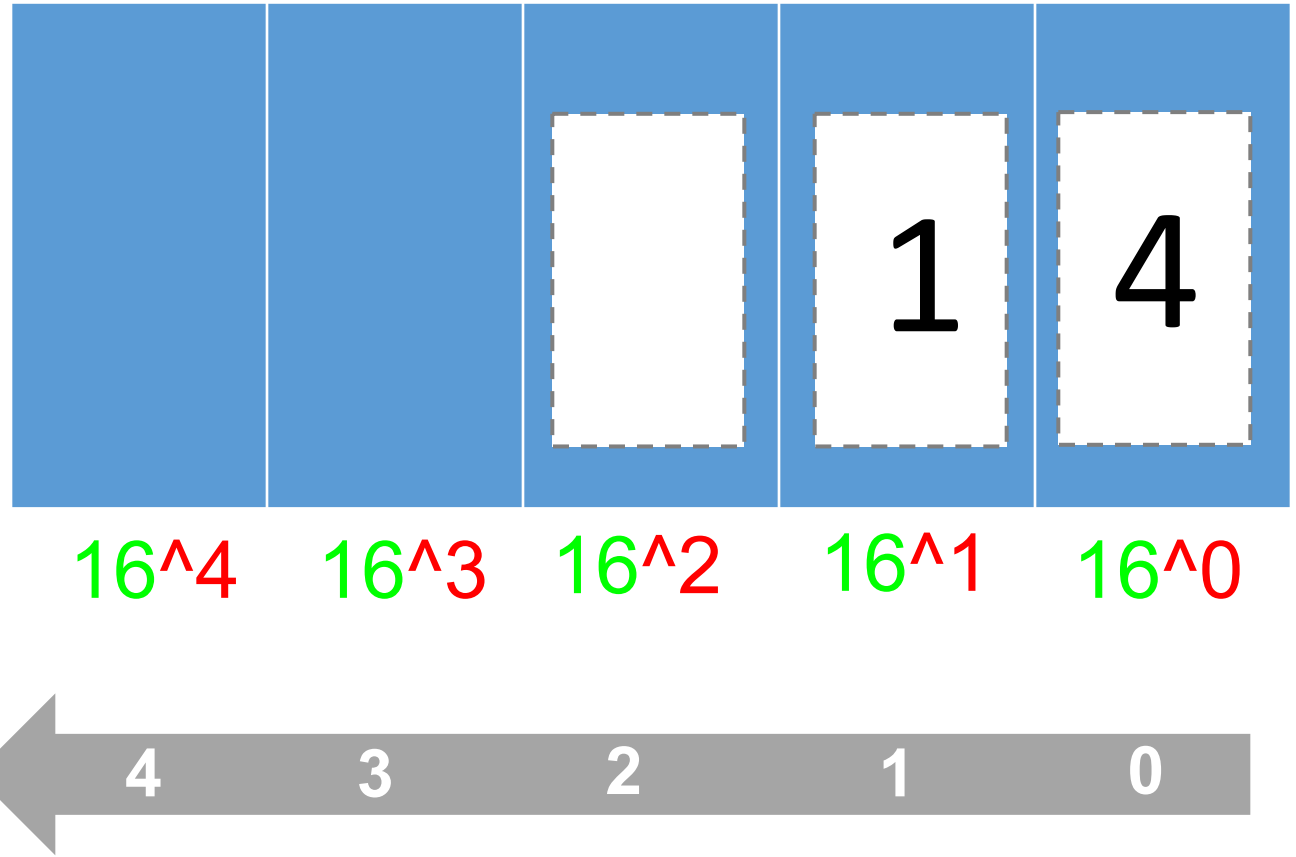
A = 10
B = 11
C = 12
D = 13
E = 14
F= 15

Each SLOT contains values from 0 to 15

PRESENTATION

CLASS

Base 16 (hexa) to **Base 10** (decimal)



14

BASE 16

= 1*16^1 + 4*16^0

= 16 + 4

= 20

BASE 10

QUESTION

5 MIN

ONE

Convert this number to **base 10**

251

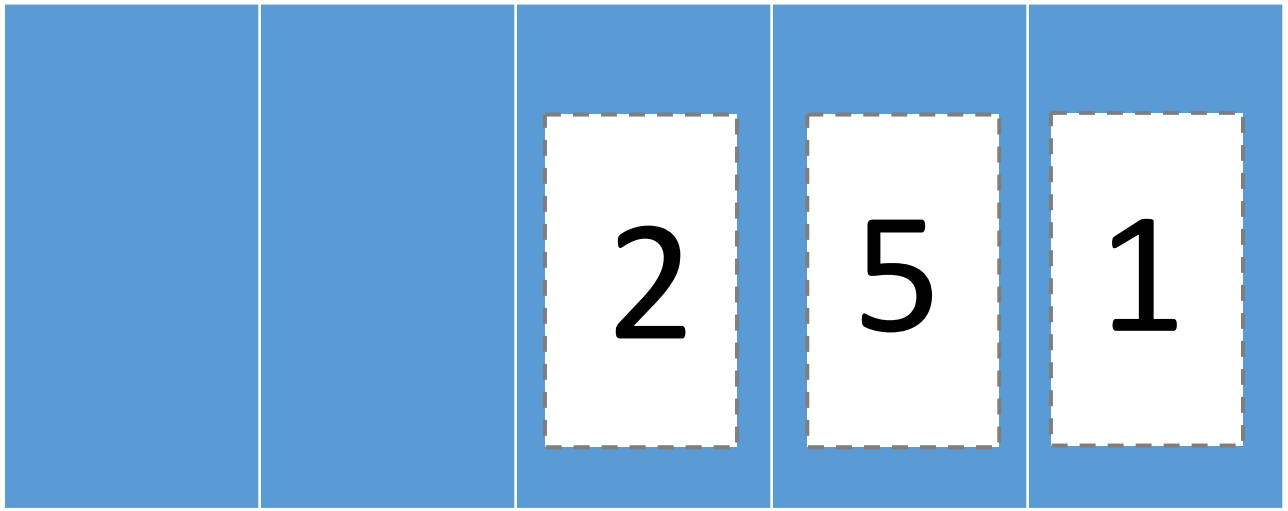
BASE 16

=

=

=

BASE 10



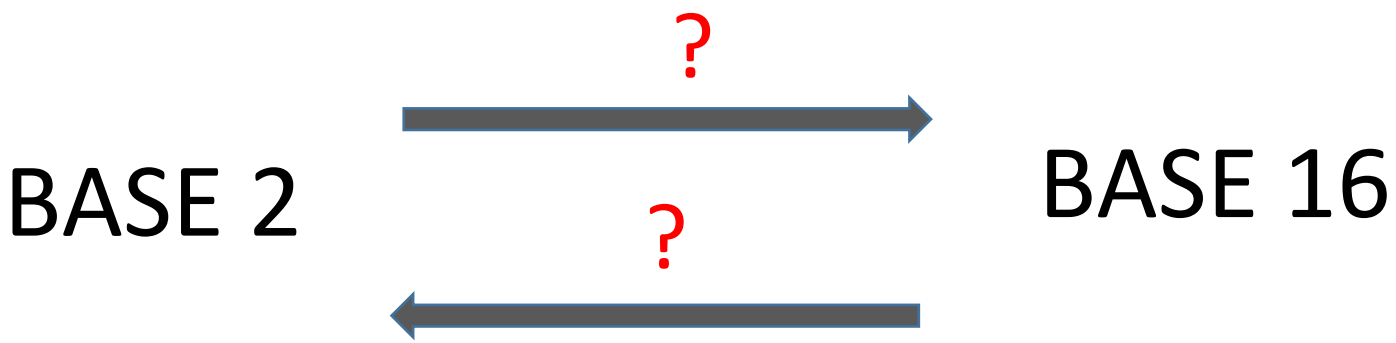
DISCUSSION

10 MIN

GROUP 2

Problem solving

How to convert binary number to hexadecimal number?



Q1 : How many **bits** (slots in base 2) do you need to convert an **hexa** (1 slot in base16) ?

Q2 : **Find a way t**o convert a number in base 2 to a number in base 16

Q3 : **Find a way t**o convert a number in base 16 to a number in base 2

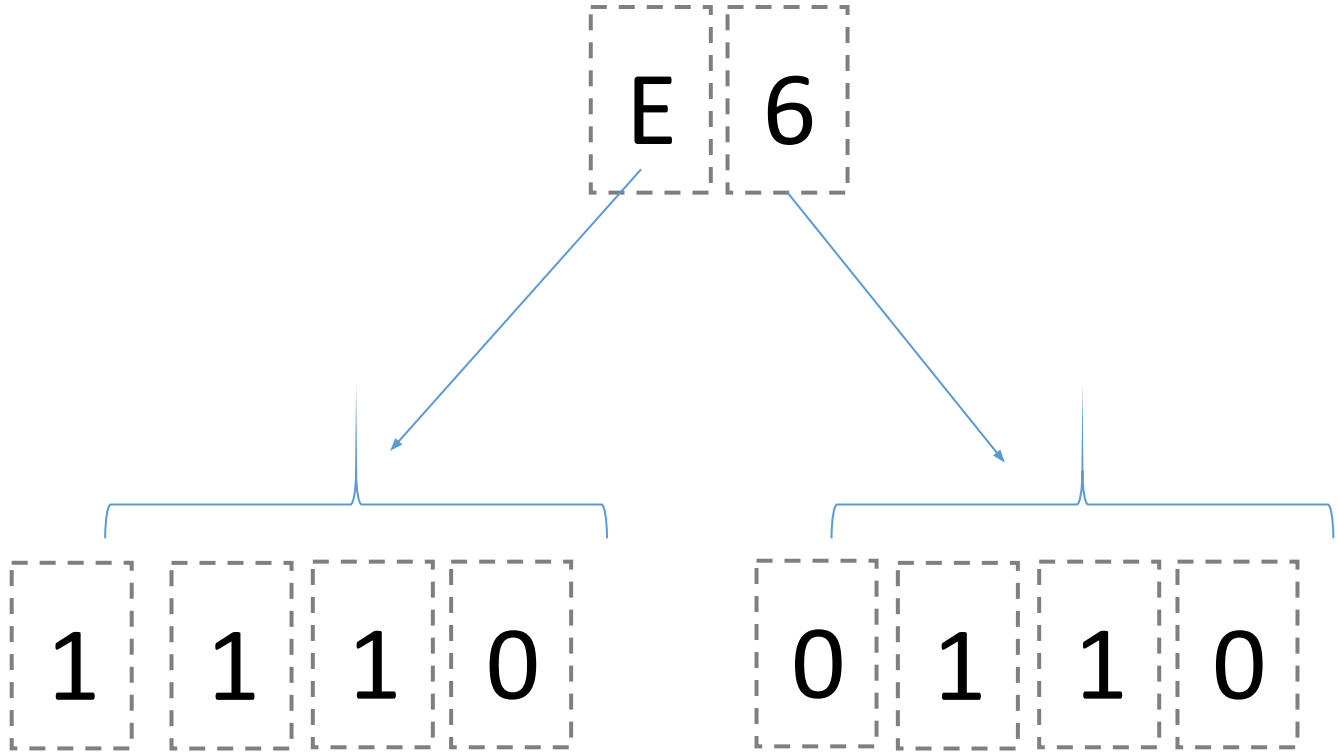
SOLUTION !

CLASS

Q2 : **Find a way t**o convert a number in base 2 to a number in base 6

BASE 16

BASE 2



So : $(E6)_{base16}$ ⍰ $(1110\ 0110)_{base2}$

PRACTICE

10 MIN

TEAM 2

Explore the odometer

https://studio.code.org/s/odometer/next

- ✔ Check the conversions between each bases are right
- ✔ "What's the largest number you can make in base 2 with the odometer ?

WRAP UP

What did we learn today ?

Explain on whiteboard what you understood about today session

BASE 8

BASE 16

HOMEWORK

BASES CONVERSIONS