

Nombres décadiques

$$\begin{array}{r}
 \dots 1 \\
 \dots 10 \\
 \dots 100 \\
 + \\
 \vdots \\
 \hline
 \end{array}$$

complément décadique [

$$\begin{array}{r}
 \dots \overset{1}{9}\overset{1}{9}\overset{1}{9} \\
 + \dots 001 \\
 \hline
 \dots 000
 \end{array}$$

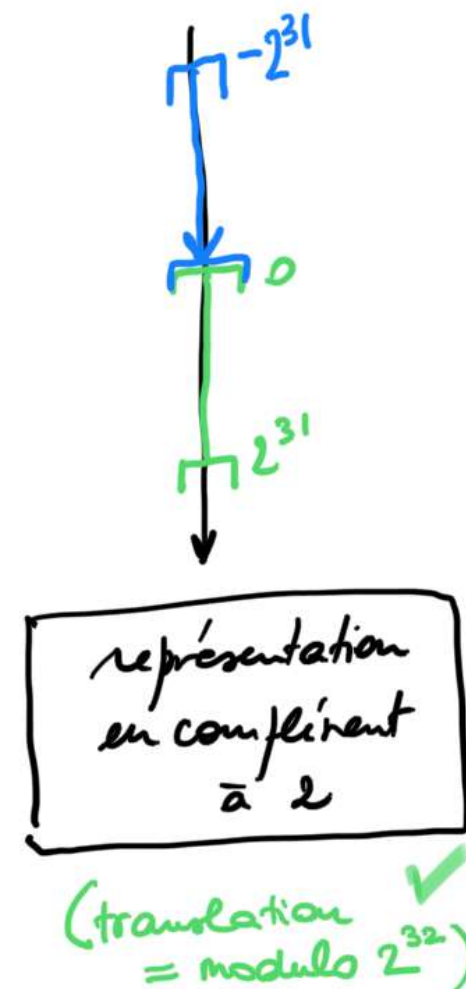
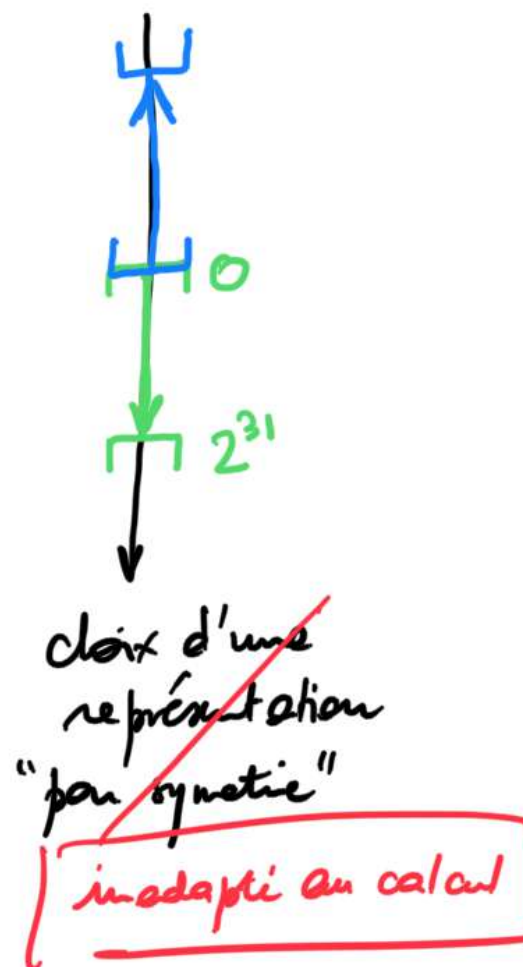
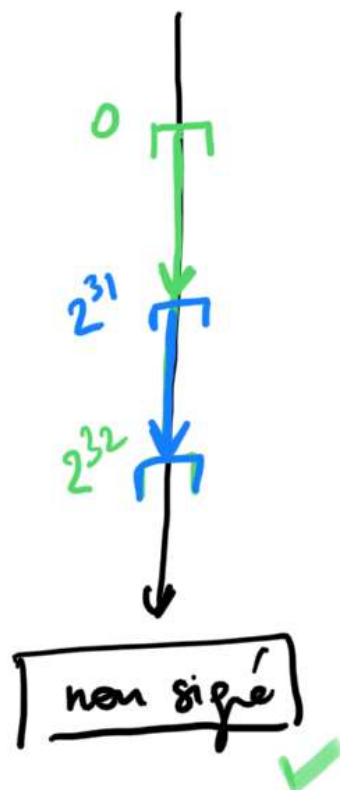
Texte

$$9 \times (\dots 111) = \dots 999 = -1$$

soit $\dots 111 = -\frac{1}{9}$

Représentation des entiers (positifs ou quelconques) en machine

32 bits.



Arithmétique en complément à 2 (ici sur 8 bits)

$$16 + 24 = ?$$

$$\begin{array}{r} 00010000 \\ + 00011000 \\ \hline (00101000)_2 = (40)_{10} \end{array}$$

$$16 + (-24) = ?$$

$$\begin{array}{r} (00010000)_2 \\ + (11101000)_2 \\ \hline (11111000)_2 \end{array}$$

complément
à 1
addition
de 1

$$(24)_{10} = (00011000)_2$$

$$(11100111)_2$$

$$\begin{array}{r} + \\ \hline (11101000)_2 = (-24)_{10} \end{array}$$

complément
à 2

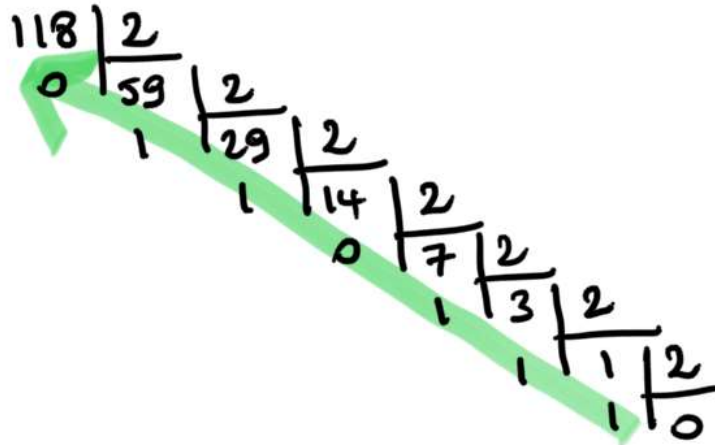
complément
à 2

$$\begin{array}{r} (?)_{10} = (11111000)_2 \\ 00000111 \end{array}$$

$$\begin{array}{r} + \\ \hline (00001000)_2 = (8)_{10} \text{ donc } ? = -8 \end{array}$$

Norme IEEE 754 - binary32

Encodons $(-118,625)_{10}$



$$\begin{aligned}
 0,625 \times 2 &= 1,250 \\
 0,250 \times 2 &= 0,500 \\
 0,500 \times 2 &= 1,0
 \end{aligned}$$

$$\begin{aligned}
 (-118,625)_{10} &= -(1110110,101)_2 \\
 &= -(1, \underbrace{110110101}_{\text{mantisse}} \times 10^{\boxed{110}})_2
 \end{aligned}$$

Signe \rightarrow 1
 biaisage \downarrow 00000110 = exposant
 + 01111111 = biais
 00000101 = exposant biaisé

