Extrait de la session principale 2022-2023 ⑦

1] Valeur $= (-1)^{sn} \times 2^{\text{Exposant}-64} \times 0,1\,\text{mantisse}$

$(0,7)_{10} = 0,1011001100 = (0,10\overline{(1100)}_2)_2$

$= 0,10\overline{1100}_2 \times 2^0$

$0,7 \times 2 = 1,4$
$0,4 \times 2 = 0,8$
$0,8 \times 2 = 1,6$
$0,6 \times 2 = 1,2$
$0,2 \times 2 = 0,4$
$0,4 \times 2 = 0,8$
$0,8 \times 2 = 1,6$
$0,6 \times 2 = 1,2$
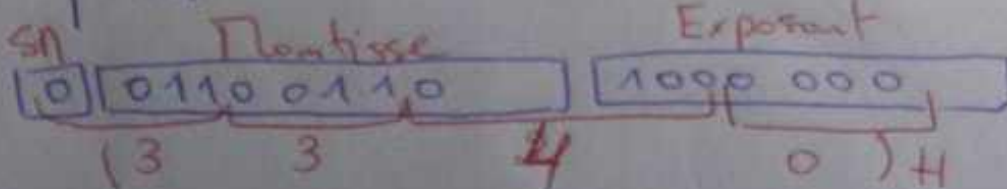$0,2 \times 2 = 0,4$
$0,4 \times 2 = 0,8$
$0,8 \times 2 = 1,6$

$\begin{cases} S_n = 0 \\ E_{Rep} = 0.64 = 64 \\ \Pi_{Rep} = 0,101100110 \end{cases}$ $\Rightarrow$ $\begin{cases} S_n = 0 \\ E_{Rep} = 1000\,000 \\ \Pi_{Rep} = 0110\,0110 \end{cases}$

sn	Mantisse	Exposant
0	0110 0110	1000 000

$(3 \quad 3 \quad 4 \quad \quad 0 \ )_H$

2] $R_1 = (E041)_H$

$\boxed{1\ | 110\ 0000\ 0 | 100\ 0001}$

$\begin{cases} S_{Rep} = 1 \\ E_{Rep} = 100\,001 \\ \Pi_{Rep} = 1100\,0000 \end{cases}$ $\Rightarrow$ $\begin{cases} S = 1 \\ E_{Rep} = 65 - 64 = 1 \\ \Pi_{Rep} = 0,111\,00\,0000 \end{cases}$

$R_1 = (-1)^1 \times 2^1 \times (0,111)_2$

$= -(1,11)_2 = -1,75$

3] $R_1 \times R_2 = (-1)^0 \times (1,0)_2 \times 2^{-1} \times (-1)^0 \times (1,0)_2 \times 2^8$

$= (-1)^{0+1} \times 2^{8+(-1)} \times (1,0)_2$

$= -2^7 \times (1,0)_2 = -127$

$\begin{cases} S_{Rep} = - \\ E_{Rep} = 7 \\ \Pi_{Rep} = 1,0 \end{cases} \Rightarrow \begin{cases} S_{Rep} = 1 \\ E_{Rep} = 7+127 = 134 = 10000110 \\ \Pi_{Rep} = 0 \end{cases}$

| 1 | 1000 0110 | 000 0000 0000 0000 0000 0000 |

(C   3   0   0   0   0   0   0) H

Extrait de la session principale 2020-2021

1) $(16,875) = (10000,111)_2 = 1,0000111 \times 2^4$

$\begin{cases} S_{Re} = + \\ M_{Re} = 1,0000111 \\ E_{Re} = 4 \end{cases} \Rightarrow \begin{cases} S_{Rep} = 0 \\ \Pi_{Rep} = 0000111 \\ E_{Rep} = 127+4 = (1000\,0011)_2 \end{cases}$

| 0 | 100 0 0011 | 00 0001110 0000 0000 0000 000 |

4   1   8   7   0   0   0   0

$(16,875)_{10} = (41870000)_H$

2) 420C6666 H

| 0 | 100 0010 0 | 000 1100 0110 0110 0110 0110 |

S   Exposant   Mantisse

$\begin{cases} S_{Rep} = 0 \\ E_{Rep} = 10000100 \\ \Pi_{Rep} = 1,000110001100110011001100110 \end{cases} \Rightarrow \begin{cases} S_{Rep} = 0 \\ E_{Rep} = 132-127 = 5 \\ \Pi_{Rep} = 000110001100110 \end{cases}$

Valeur : $(-1)^0 \times 2^{5} \, 1,000110001100110011001100110$

$= 100011,00011001100110011001100110$

$= 67,$

3F 00 00 00 H

(0)011 1111 0000 0000 0000 0000 0000 0000 0000

Signe Exposant   Mantisse

$$\begin{cases} S_{Rep} = 0 \\ E_{Rep} = 0111\ 1110 \\ M_{Rep} = 1p \end{cases} \Rightarrow \begin{cases} S_{Re} = + \\ E_{Re} = 126 - 127 = -1 \\ M_{Re} = 0\,1,0 \end{cases}$$

$$Valeur = (-1)^0 \times 2^{-1} \times (1,0)_2$$
$$= +0,5$$

3)

$$\begin{cases} S_{Rep} = 0 \\ M_{Rep} = 11.1\sim 11 \\ E_{Rep} = 1111\ 1110 \end{cases} \Rightarrow \begin{cases} S_{Re} = 0 \\ M_{Re} = 1,11111\ \ldots\ 11 = 2 - 2^{-23} \\ E_{Re} = 254 - 127 = \end{cases}$$

	Hexadécimale	Décimale
Plus grand Réel Positif	7F7FFFFF	$2^{127}(2 - 2^{-23})$
Plus petit Réel négatif	FF7FFFFF	$-2^{127}(2 - 2^{-23})$

Extrait de la session de contrôle 2022-2023   (4)

1) $0,0125 = 0,00000011 0011 = 0,110011 \times 2^{-6}$

$0,0125 \times 2 = 0,025$
$0,025 \times 2 = 0,05$
$0,05 \times 2 = 0,1$
$0,1 \times 2 = 0,2$
$0,2 \times 2 = 0,4$
$0,4 \times 2 = 0,8$
$0,8 \times 2 = 1,6$
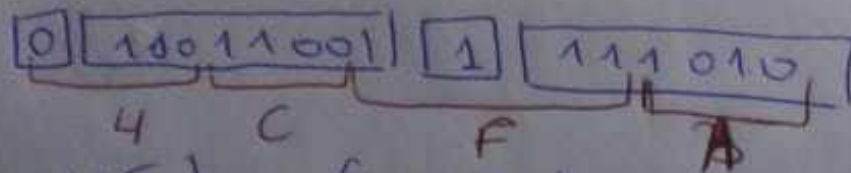$0,6 \times 2 = 1,2$
$0,2 \times 2 = 0,4$
$0,4 \times 2 = 0,8$
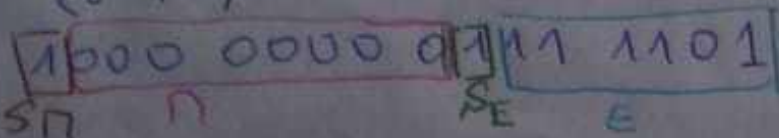$0,8 \times 2 = 1,6$
$0,6 \times 2 = 1,2$

$Valeur = (-1)^{sn} \times 2^{Ex} \times 0,1\,Mantisse$

$\begin{cases} S_{Rep} = Sn = + \\ E_{Rep} = -6 \;\; CA2 \Rightarrow \\ \Pi_{Rep} = 100110011 \end{cases}$

7 bit
$\overline{0000\,110}$ CA1 $111\,11\,0011$
$+ \qquad 1$
$\underset{SE}{\boxed{1}}\underset{Exposant}{111\,010}$

$\begin{cases} Sn = 0 \\ Mantiss = 1001100l \\ S_E = 1 \\ E_{Rep} = 111010 \end{cases}$

$\boxed{0}\;\boxed{100\,11\,001}\;\boxed{1}\;\boxed{111\,010}$
4   C   F   A

$(0,0125)_{10} = (4CFA)_H$

2) $(807D)H$

$\boxed{1}000\;0000\;0\boxed{1}11\;1101$
Sn   n   SE   E

$\begin{cases} S_{Rep} = 1 \\ \Pi_{Rep} = 0 \\ E_{Rep} = \boxed{1}111\,1101 \;\; \underset{\text{bit de signe }(-)}{} \end{cases}$
$\Rightarrow$ CA1 $111\,1101$ = $1111\,1101$
CA1 $0000\,0010$
$+ \qquad 1$
$\overline{0000\,0011}$
$= (-3)$

$\begin{cases} S_{Rep} = 1 \\ \Pi_{Rep} = 0,10 \\ E_{Rep} = -3 \end{cases}$

juste

Scanned with ACE Scanner

$$Valeur_1 = (-1)^1 \times 2^{-3} \times (0,1)_2$$
$$= -0,0001 = -2^{-4} = -0,0625$$

•) $(0082)_H$

$$\boxed{0\,|\,000\ 0000\ 1\,|\,000\ 0010}$$
$$S_n \qquad n \qquad\qquad S_E \quad e$$
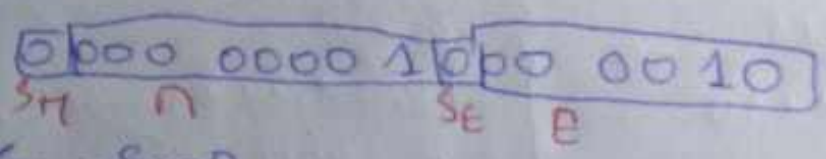
$$\begin{cases} S_{Rep} = S_n = 0 \\ Exp = 000010 = 2 \\ n_{Rep} = 0000\ 0001 \end{cases} \Rightarrow Valeur_1 = (-1)^0 \times 2^2 \times (0,10000000)$$
$$= 10,000\ 0001$$

3) $V_1 \times V_2 = (-1)^1 \times 2^{-3} \times (0,1)_2 \times (-1)^0 \times 2^2 \times (0,10000001)_2$

$$= 2,0078125$$

Notion

$$R_1 + R_2 = \Pi_1 b^{e_1} + \Pi_2 b^{e_2}$$
$$= [\Pi_1 + \Pi_2\, b^{e_2 - e_1}]\, b^{e_1}$$
$$R_1 - R_2 = \Pi_1 b^{e_1} - \Pi_2 b^{e_2}$$
$$= [\Pi_1 - \Pi_2\, b^{e_2 - e_1}]\, b^{e_1}$$
$$R_1 \times R_2 = \Pi_1 b^{e_1} \times \Pi_2 b^{e_2}$$
$$= [\Pi_1 \times \Pi_2]\, b^{e_1 + e_2}$$
$$\frac{R_1}{R_2} = \Pi_1 b^{e_1} / \Pi_2 b^{e_2} = \frac{\Pi_1}{\Pi_2}\, b^{e_2 - e_1}$$

$$V_1 \times V_2 = (-1)^1 \times 2^{-3} \times (0,1)_2 \times (-1)^0 \times 2^2 \times (0,10000001)_2$$
$$= (-1)^1 \times 2^{(-3+2)} \times (0,1) \times (0,10000001)_2$$
$$= (1)^1 \times 2^{-1} \times (0,10000001)$$
$$= 2^{(-2)} \times (0,10000001)$$
$$= -0,12695312$$

Nohin

Max positif / Min négatif (pour 32 bit)

$$\begin{cases} S_{Rep} = 0 \\ M_{Rep} = 11\ldots11 \\ E_{Rep} = 1111\,1110 \end{cases} \Rightarrow \begin{cases} S_{Re} = + \\ M_{Re} = 1,1111\ldots11 = 2 - 2^{-23} \\ E_{Re} = 254 - 127 \end{cases}$$

$Max_+ = (7F7FFFFF)H$

$= 2^{127}(2 - 2^{-23})$

$Min_- = (FF7FFFFF)H$

$= -2^{127}(2 - 2^{-23})$

~~Min négative~~ ~~Max~~

Min positive / Max négative

$$\begin{cases} S_{Rep} = 0 \\ M_{Rep} = 00\ldots00 \\ E_{Rep} = 00000001 \end{cases} \begin{cases} S_{Re} = + \\ M_{Re} = 1,0\ldots00 = 1 \\ E_{Re} = 1 - 127 = -126 \end{cases}$$

$Min_+ = 00800000\ H$

$= + 1,0 \times 2^{-126} = 2^{-126}$

$Max_- = 80800000\ H$

$= - 2^{-126}$

$R_2 = (0043)H$

$$\boxed{0}\ \boxed{000\ 0000\ 0}\ \boxed{100\ 0011}$$
S   n   E

$\begin{cases} S_{Rep} = 0 \\ E_{Rep} = 1000011 \\ n_{Rep} = 0 \end{cases}$ $\Rightarrow$ $\begin{cases} S_{Rep} = 0 \\ E_{Rep} = 64+3 = 67 - 64 = 3 \\ n_{Rep} = (0,1)_2 \end{cases}$

$$R_2 = (-1)^0 \times 2^3 \times (0,1)_2$$
$$= (100)_2 = 4$$

$$\frac{R_1}{R_2} = \frac{(-1)^1 \times 2^1 \times (0,111)_2}{(-1)^0 \times 2^3 \times (0,1)_2}$$