

$X_{hex} = 431D30B0$   
 $X_2 = 01000001100011101001100001011$   
 $X_{hex} = X_2 =$

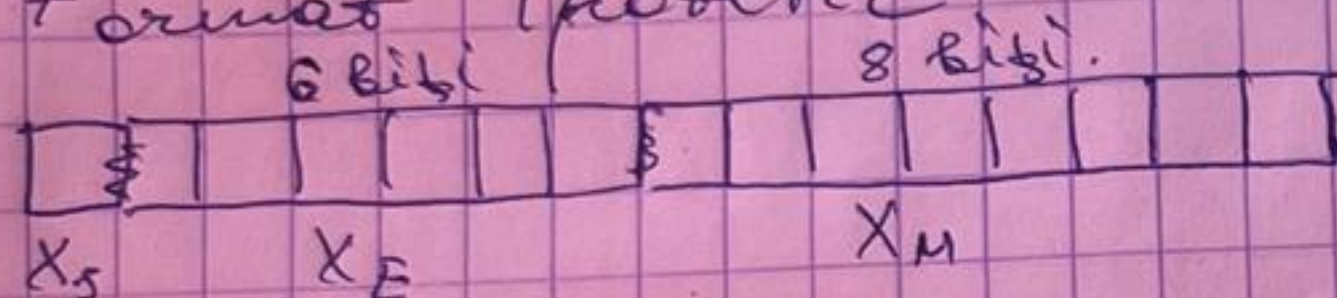
$X_{hex} = X_2 = \underbrace{01000100}_{67 = X_E} \Rightarrow X_E - 64 = 3$

$$X_{IBM} = (-1)^0 \cdot 16^3 \cdot 0,00011101001100001011 =$$

$$= + 11 + 0 + 00 + 1, 00001011. \Leftrightarrow$$

$$X_{10} = +467,04296875_{10}$$

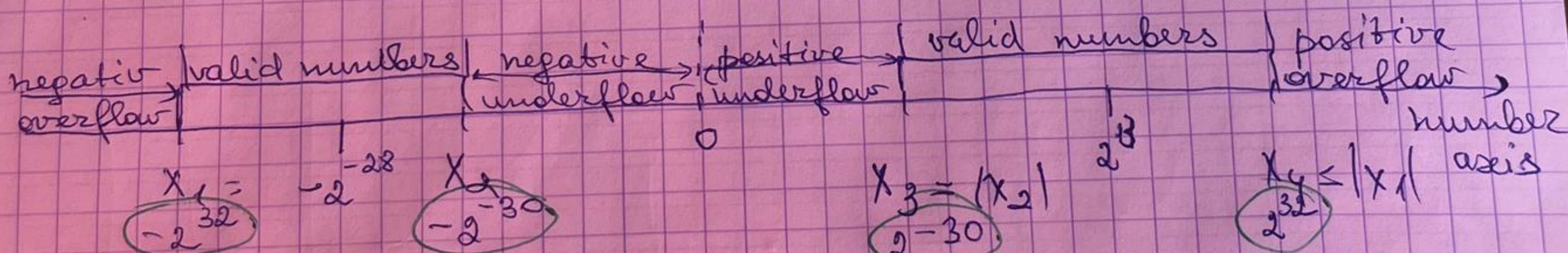
e) Format ipotetic



- sign = 0, pentru numere  $> 0$   
 \ 1, pentru numere  $< 0$

- exp.
- 8 biți.
- bias =  $2^5 - 1 = 31$
- poate avea valori de la 1 la 63
- 0 și 63 sunt speciale
  - ↓ denorm
  - ↓ NaN

- mantisa  $\rightarrow$  normalizarea conduce la "hidder bit"



$$x_1 = [1, 1, 1, 1, 0, 1, 1, 1, 1, 1, 1, 1]$$

$$x_1 = (-1)^1 \cdot 2^{62-31} \cdot \left(1 + \frac{1}{2} + \frac{1}{4} + \dots + \frac{1}{2^8}\right) = -2^{31} \cdot \frac{512}{256} = -2^{32} = -10^{9,6} \quad 10 \dots 3$$

$$X_2 = 10000010000000$$

$$x_2 = (-1)^1 \cdot 2^{1-31} \cdot (1 + 0 + 0 + 0 + 0 + 0 + 0) = -2^{-30} = -10^{-9}$$

$$\begin{array}{r} 10 \dots 3 \\ - 30 \dots x \\ \hline x = -9 \end{array}$$

$$\begin{array}{r} 10 \dots 3 \\ 32 \dots x \\ \hline x = 9,6 \end{array}$$



# Subject 2

$$X_{hex} = 431D30B0$$

$$X_{hex} = X_2 = \begin{array}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|} \hline X_s & & & & & & X_E & & & & & & & & & X_M \\ \hline 0 & 1 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 1 \\ \hline \end{array}$$

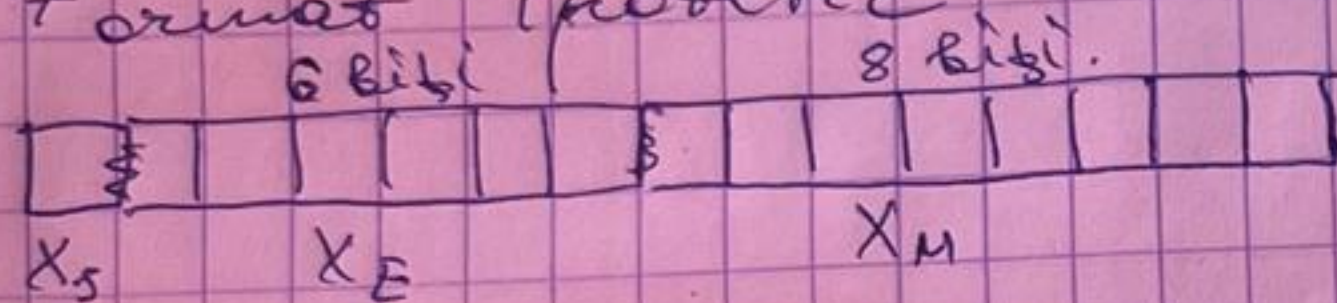
$$67 = X_E \Rightarrow X_E - 64 = 3$$

$$X_{IBM} = (-1)^0 \cdot 16^3 \cdot 0,00011101001100001011 =$$

$$= +111010011,00001011 \Leftrightarrow$$

$$X_{10} = +467,04296875_{10}$$

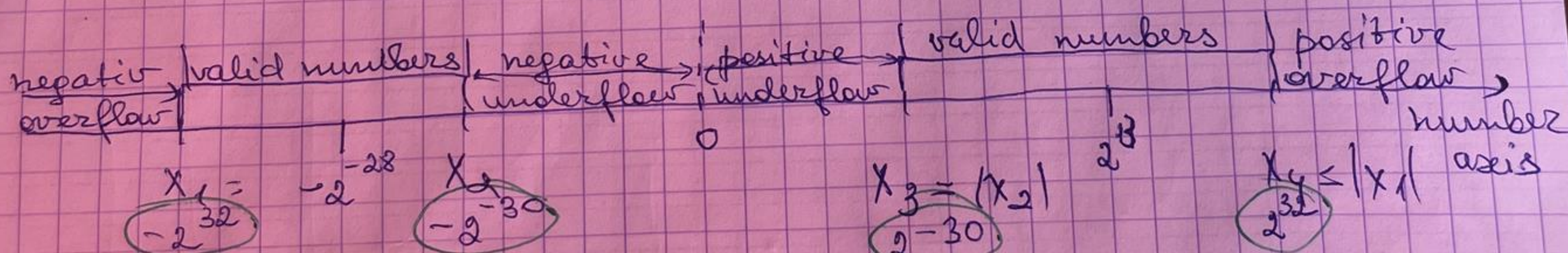
## p) Format ipotetic



- sign - 0, pentru numere > 0  
          1, pentru numere < 0

- exp. - 6 biti
  - bias =  $2^5 - 1 = 31$
  - poate avea valori de la 1 la 63
  - 0 și 63 sunt speciale
    - ↓ denorm
    - ↓ NaN

- mantisa → normalizarea conduce la "hidden bit"



$$X_1 = \begin{array}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|} \hline 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ \hline \end{array}$$

$$X_1 = (-1)^1 \cdot 2^{62-31} \cdot \left(1 + \frac{1}{2} + \frac{1}{4} + \dots + \frac{1}{2^8}\right) = -2^{31} \cdot \frac{512}{256} =$$

$$= -2^{32} = -10^{9,6}$$

$$\begin{array}{r} 10 \dots 3 \\ 32 \dots x \\ \hline x = 9,6 \end{array}$$

$$X_2 = \begin{array}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|} \hline 1 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \hline \end{array}$$

$$\begin{array}{r} 10 \dots 3 \\ -30 \dots x \\ \hline x = -9 \end{array}$$

$$X_2 = (-1)^1 \cdot 2^{1-31} \cdot (1 + 0 + 0 + 0 + 0 + 0) = -2^{-30} = -10^{-9}$$



$$Y = 2^{13} = (-1)^0 \cdot 2^{13} \cdot (1 + 0 + 0 + 0) \\ X_E - 31 = 13 \Rightarrow 44_{10} \Rightarrow 101100_2$$

$$\begin{array}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|} \hline 0 & 0 & 1 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \hline \end{array}$$

$$Z = -2 - 28 = (-1)^1 \cdot 2^{-30} \cdot 2 = -2 - 28 = -30$$

$$\begin{array}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|} \hline 0 & 1 & 0 & 1 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \hline \end{array}$$

$$Z_{16} = 5E40$$

$$X_{16} = 467, 042968$$

$$X = 1.0163 \cdot 0.0001101$$

$$Y_{16} = 2C00$$

$$Z_{16} = 5E40$$